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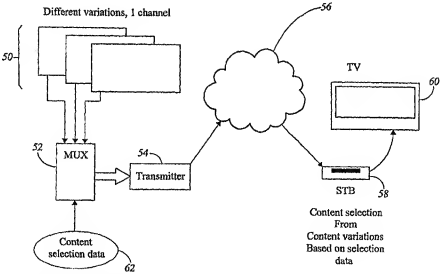

(57) Abstract: A system and method for the simultaneous creation, assembly and transmission of synchronous multiple personalized messages to specific targeted individuals or other entities. The system can send rich media distinctly personalized messages such as commercials to a small or large group of selected individuals through any appropriate distribution media (56). A personalized message is created based on segmenting a message into multiple slots (66), and providing different selectable segments (70) for each slot (66). The multiple segments (70) are then simultaneously broadcasted over multiple data streams (50) to a receiver (58), wherein the receiver (58) switches between the data streams (50) to assemble the personalized message in a just-in-time fashion. Other data including overlays, animation, frame transitions etc. may also be transmitted and used to assemble the personalized message.

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SYSTEM AND METHOD FOR SIMULTANEOUS BROADCAST FOR PERSONALIZED MESSAGES

RELATED APPLICATION

This patent application claims priority to U.S. Provisional Application Serial No. 60/236,990 filed September 29, 2000 by Haberman et al., which is hereby incorporated by reference.

This patent application is also a continuation-in-part of and claims the benefit of U.S. Application No. 09/545,015 filed on April 7, 2000, which is incorporated herein by reference.

FIELD OF THE INVENTION

This invention is directed towards media (video, audio, text, graphics, etc.) creation and delivery, and more particularly towards a system for creating, delivering, and assembling personalized messages based on user information.

BACKGROUND

Marketers have come to rely on demographic solutions to establish patterns and trends about the purchasing habits of customers and how these habits relate to purchases, demographics, and other factors. Alongside companies' proprietary databases, third party data warehouses have evolved, fashioned by many companies who share information either about specific customers or about data extracted from their customer bases. In both cases, advertisers use the derived information to generate observations relating to their markets, target individuals to different types of offerings and select appropriate media purchases for advertising.

In the case of video advertising media, e.g., video tapes that are mailed, internet video streams, or broadcast television (whether via terrestrial, cable, satellite, or any other distribution medium) advertising – there are only limited means to produce and/or deliver personalized versions of the advertisements that directly take advantage of the information available about consumers purchasing habits and the like. Mostly, this reflects the nature

(such as bandwidth constraints) of the traditional delivery media for video, which provide very limited capability to deliver anything more than a common message.

Fig. 1 shows the global layout of a broadcast delivery chain as deployed today. In this model, each source has a separate channel to all receivers (which can be separate set-top boxes, televisions, etc.). The same information is send to all receivers. If someone wants to create a source that must only go to a subset of the receivers, they must create a new channel and limit the receivers to only receive that channel they are entitled to show. Personalization creates different variants of the source for different receivers. Potentially this can lead to a different variant for each receiver. Adding personalization to this model would mean that, worst-case, every source would need a separate channel to every receiver, which is impossible under the current bandwidth limitations. Basically every user would need a high bandwidth point-to-point connection to the source. Although current VOD (video on demand) systems deployed on digital networks provide high bandwidth channels to viewers, these systems are still very expensive, and can only serve a limited percentage of the total subscriber base simultaneously. Thus, within the currently existing bandwidth constraints, only a few different variations of the same channel can be transmitted simultaneously, allowing personalization only for a few viewers, or very limited personalization for large groups of viewers. This makes the tradeoff between bandwidth lost and capabilities gained not interesting enough. There really must be a higher level of personalization for a larger amount of viewers with the same bandwidth tradeoff before this becomes interesting.

In addition to the limitations imposed by the delivery medium, no advertiser is going to create/produce many different versions of one and the same message, simply because there is no time and/or resources to create the required diversity. The nature of video production, focused typically on one sequential video story, does not allow for incremental content changes. This forces advertisers to avoid topically relevant information and offerings.

As such, even though companies know a tremendous amount of information about their customers, the ability to leverage this information has been limited by the nature of video creation/production and the fundamentals of the broadcast medium, requiring a bland vanilla message to be sent to all customers.

SUMMARY

The present invention provides for a system for the simultaneous creation/production, delivery/transmission, and assembly of synchronous multiple personalized messages to specific targeted individuals, households, or other entities. The system can send rich media distinctly personalized messages to a small or large group of selected individuals through any appropriate distribution media.

The present invention includes a system and method for allowing the creation of a plurality of personalized messages comprising creating a personalized message template with a plurality of slots in sequence, wherein at least one of the slots can include one of a plurality of different segments, with all segments for a particular slot being a same length. The method includes providing a plurality of data streams to a receiving unit, each data stream delivering a different one of the plurality of segments for the at least one slots, wherein the segments are synchronized to begin and end at substantially the same time, and

providing content selection information regarding content of the plurality of data streams to the receiving unit, the information including switch times for the plurality of synchronized segments, to allow the receiving unit to select among the plurality of data streams for one of the segments for the particular slot, to assemble a personalized message.

The present invention also includes wherein the receiving unit selects among the plurality of data streams in real time, and also wherein the personalized message is viewed by a viewer as it is assembled. The receiving unit can select among the plurality of data streams based on the content selection information and information about a viewer who will view the personalized message. Further, a data stream may be provided with a default personalized message to allow the receiving unit to display the default personalized message without selecting between the plurality of data streams. The plurality of data streams may be MPEG encoded data streams, and further the plurality of data streams can be multiplexed into a transport stream.

The present invention also includes wherein the segments are incomplete parts of a personalized message. Further, the present invention includes wherein the receiving unit is a set top box. The set top box can receive both analog data streams and digital data streams, and the set top box can momentarily switch from an analog data stream to a digital data stream to play out a personalized message. Further, the set top box can switch from an

analog data stream to a digital data stream triggered by VBI data. Alternatively, thee set top box can momentarily switch from a first digital data stream to a second digital data stream to play out a personalized message, however triggered. The set top box can receive a plurality of television channels over the data streams, and the channels include programs include a synchronized commercial break. During the synchronized commercial break, the data streams deliver segments to create a personalized message for display irrespective of which channel the set top box had selected.

The present invention also includes transition segments, which are inserted into the personalized message between the segments. Further it includes a plurality of templates for creating the personalized messages, wherein the templates include video sequence templates and audio sequence templates.

The present invention also includes a system and method for delivering a plurality of different messages over a television transmission network, including creating a plurality of different media segments, wherein the different media segments include incomplete sections of a complete message, and wherein at least one subset of the media segments are a same length. It includes transmitting a plurality of television programs to a television signal receiver, wherein the plurality of television programs have at least one synchronized commercial break; and during the synchronized commercial break, transmitting the plurality of different media segments to the television signal receiver, wherein all media segments in the at least one subset are transmitted simultaneously. The present invention further includes directing the television signal receiver to switch to one of the media segments in the subset as the media segments in the subset are received; and wherein after the synchronized commercial break, the television signal receiver switches to a previously selected television program.

An illustrative embodiment of the present invention provides all of the following functions:

Acquire and compile information that delineates the profiles of groups of individuals, enterprises, organizations or any identifiable entities. This information may be acquired through data mining organizations, collaborative profiling with the input of the entity to be characterized, regional and local demographics, the client customer, or other sources of information. This information will be organized in a special target entities

information database. These profiles will be used to control specific profile driven message insertion and assembly units.

Acquire current information concerning news, weather, business conditions, user responses, and/or the status of any conditions relevant to the messaging content and/or context.

Provide for the creation, acquisition, synthesis, storage, and generation of multimedia (e.g., video, audio, still images, and text) modular information segments that can be generated and assembled utilizing entity profiles to drive rules based expert systems incorporated in message sequence templates. This information would constitute a resource library from which custom presentations for target individuals, or other entities could be assembled for the purpose of advertising, instruction, promotion, political persuasion, or any informational agenda. This material will be available through a special media database addressable via the semantics of composition.

Simultaneously and synchronously insert multimedia modular information segments and other information into the appropriate slots in a broadcast transmission stream for delivery to the entire selected group of users or entities at their media specific location.

Determine a message slot template based on which a profile driven assembly unit assembles personalized messages from the set of multimedia modular information segments and other information based upon each entity profile and its associated rules.

Track and verify all messages and provide for client reports and billing as required. Also monitor and receive responses if required or needed and analyze and compile such information for the client user.

U.S. patent 4,573,072 issued to Freeman, describes a system for switching between complete commercials sent over multiple channels, to allow different commercials to be displayed to a viewer, depending upon the viewer's interactive choices for commercial preferences. However, this patent only allows selection of substantially complete commercials, and has no disclosure of being able to assemble a personalized message in real time, both in terms of multiple segments for a message, but also in terms of various incomplete media components such as multiple and separate audio, video, graphics, rendering, and last minute information. Freeman also does not disclose both the synchronous and simultaneous insertion of modular incomplete media components to allow

seamless assembly into complete personalized messages, which is enabled by digital television. Further, Freeman discloses using minimal or no criteria for selecting which commercial to show.

An advantage of the present invention includes an ability to deliver and distribute personalized messages over communication channels with present-day bandwidth limitations using present-day (already deployed) hardware and technology.

Another advantage of the present invention includes a system which allows for the efficient creation, production, delivery, transmission, and assembly of a very large number of personalized messages. This can typically be done at the same or lower cost (bandwidth, labor) required for doing the same steps for a few messages independent from each other.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other features and advantages of the present invention will be more fully understood from the following detailed description of illustrative embodiments, taken in conjunction with the accompanying drawings in which:

Fig. 1 is a block diagram showing a typical one to all broadcast television approach;

Fig. 2 is a block diagram showing a one to all broadcast television approach with additional data provided in accordance with the present invention;

Fig. 3 is a block diagram of multiple segments for simultaneous broadcasting;

Fig. 4 shows a set of audio and video templates for an example personalized message;

Fig. 5 illustrates how overlapping slots occur for an example personalized message;

Fig. 6 shows an example video template for a vacation commercial according to one embodiment of the present invention;

Fig. 7 is a block diagram of personalized data stream creation from simultaneous broadcast according to the present invention;

Fig. 8 is a data stream prepared according to one embodiment of the present invention;

Fig. 9 provides head-end processing steps for personalization according to the present invention;

Fig. 10 provides details of distribution of responsibility in a receiver software system;

Fig. 11 shows details of a personalization engine, within a receiver;

Fig. 12 is a block diagram of a typical receiver for digital television; and

Fig. 13 illustrates the resulting transport stream layout according to the present invention.

DETAILED DESCRIPTION

The goal of personalized messages is providing viewers with programs, messages and commercials that are more relevant given their personal situation. Personalized messages can be part of traditional broadcast (digital) television, advanced broadcast (digital) television (incl. video on demand) or streamed programs on the Internet (just like ordinary commercials). Some sample embodiments include Personalized Ads, Personalized News, etc.

An important feature of personalized messaging is that the production of the personalized messages only requires limited extra effort compared to current messages (such as commercials). A solution to this requirement is described in detail in U.S. Application No. 09/545,015 filed on April 7, 2000 of which the present application hereby incorporates by reference. Generally, a system according to the invention works as shown in Fig. 3. A complete message or commercial 64 is segmented in a number of different (time)slots 66. Each timeslot can have an arbitrary length, as small as a second, or even less. The present invention allows for multiple options 68 per slot. Depending on the individual characteristics of a viewer, for each slot a different option 68 is chosen. This way, with a limited amount of additional effort during production many different instances of the commercial 64 can be created. For example, using the 13 segments 68 as shown in Fig. 3 (instead of 5 in a linear, single, commercial), a system according to the present invention can generate 36 (2x3x6) different instances of the commercial 64.

The present invention provides for the ability to customize personalized messages at the location in the delivery chain which best suits the requirements for personalization and delivery constraints. By selecting the best option for each slot to be played in the receiver (whether the set top box 58 or television 60, see Fig. 2), a last minute edit phase is added to

the broadcast chain. By creating different variants of each slot, the present invention can create multiple versions of an entire audio feed, video feed, or TV channel, by combining the parts in different ways. By labeling the parts with personalization information 62, and distributing a user profile to near the end of the broadcast chain, for example to the STB 58, the STB 58 can make the final selection from the parts by matching the personalization information 62 against the user profile for each of the possible choices. That way the STB 58 creates a path through the entire set of content and presents the viewer with the best possible personalized television content.

As an alternative embodiment, the selection of segments may be performed on a pseudo-random or complete random fashion, to allow different variations of a personalized message by an audience. Any combination of selected segments by user profile personalization plus some randomness may be performed. Further, a system may keep track of which segments were previously shown to any audience, so in a next transmission, different segments not before seen by the audience can be shown.

In its most simple case, each slot 66 contains both audio and video (i.e., both have the same template structure), but it is possible to have separate templates 72 Fig. 4 for audio and video. The reasons for having different templates for audio and video are twofold. The first reason is an artistic one. Creative artists and authors of personalized ads generally want different variations in the audio and the video flow. The second reason is technical. In currently existing audio coding standards (including AC-3, MPEG-2, and many others), audio samples are grouped into frames (having a length of, for example, 32 milliseconds). This means that audio slots must be aligned at audio frame boundaries to be able to make a seamless switch from one slot to the next. If the slots are not aligned on frame boundaries, the slots must be padded with silence, which is disadvantageous as it leads to a break-up of the ad. Given the requirement of aligning audio slots at audio frame boundaries, it is difficult to let video and audio slots end at exactly the same time without compromising the seamless transition between slots. This means that typically audio and video will have different templates.

For audio it is even possible that each channel (for example, background music, voice-over, sound effects,...) has its own template 72. Furthermore it is possible to have multiple templates 72 for each video and/or audio channel. The template 72 to use is then

selected before the commercial starts playing (again, based on available knowledge on the viewer in viewer profiles). Fig. 4 shows an example of such a multi-template commercial (three different channels; two of those have two different templates to choose from).

Yet another option is allowing overlapping slots in a template as depicted in Fig. 5. The allowed switching between slots in this template is between slots that are exactly adjacent.

Fig. 6 provides a detailed example of a video template set up for a campaign to provide personalized commercials for vacationing in Bermuda. Based on the information or conjectures about the viewer, an appropriate segment will be selected to display. In this example, demographic information about the viewer allows the present invention to create a vacation commercial with great appeal for the viewer. This example template is coded using MPEG-2, as will be described in an illustrative embodiment provided below.

In a broadcast environment, where one source distributes exactly the same content to multiple receivers at the same time, each path through the commercial 64 that can be chosen from the templates 72 will need to have the same length. This constraint does not hold in a point-to-point situation, e.g., personalized commercials embedded in VOD, personalized news, Internet streaming, etc. In a point-to-point situation the source assembles a specific stream for an individual viewer.

To personalize a commercial 64 for each viewer in accordance with one embodiment of the present invention, the viewer-specific path through each template of the commercial 64 (i.e., the selection of the option to play for each slot) will be selected at the latest moment possible (Just-In-Time-Advertising-JITA), based on information 62, Fig. 2, available on that viewer (e.g., from customer databases).

Another last-minute edit that can be done according to the present invention is the addition of last-minute information in the form of text or graphics overlays that can be added to the commercial 58 (Fig. 2) at the receiver. This last-minute information can be viewer specific (to achieve an even higher level of personalization) or global (e.g., information on the amount of products available in stock shortly before the commercial is aired). The last-minute information can also be distributed as part of the content selection data 62 as depicted in Fig. 2.

Fig. 7 provides an overview of personalized advertising in accordance with the present invention. Within a digital broadcast transmission 56, multiple individual data streams (channels) 50 are present. The present invention uses multiple channels 50 to each carry a different data segment (slot-option) 70 for a slot 66. The selection of what segment 70 to play for each slot, and the actual switching between slots is performed as close to the final point of delivery (e.g., a set-top box or a television). As will be described in detail below, this selection and switching may be performed in an STB (set top box). Selection is done based on rules (e.g., expert system based) expressed in terms of viewer profiles. These rules can be associated, for example, with templates and individual data-segments.

To allow a switch 59 to switch between data-segments in data streams 50, the segments 70 are broadcast simultaneously on each data stream 50. For this example, three data streams 50a-c are shown, data stream 50f will be described below. The switch is presently set to data stream 50a, as shown by arrow 61. Since the segments 70 are simultaneously provided, they all have a synchronized end point (as shown by line 65), and the next set of segments have a synchronized start point (as shown by line 67). Because switching time by switch 59 is not instantaneous, a time gap 69 may be included between the end point 65 of one set of segments and the start point 67 of the next set of segments. This time gap 69 provides the delay necessary to allow the switch 59 to change seamlessly from one data stream 50a to another 50b. Output processing 63 may include buffering and other processing techniques for the data, for example to eliminate any gaps, or to add additional features to the data stream such as graphic overlays, as will be discussed below.

Although only three data streams 50a-c are shown, the present invention can use as many data streams or channels 50 to simultaneously deliver as many segments as needed. Also, multiple sets of data streams can be stacked into a broadcast, e.g., one set for a video template, and one for an audio template.

One or more additional data streams 50f may be used to carry data which assists in using the multiple segments. Such data can include the content selection data 62 Fig. 2, which provides information about each segment 70 and the appropriate segment to use. This information is used by a selection control component 71, which in an illustrative embodiment, also uses user profile information to determine which segment 70 will be

selected at which time. Alternatively the content selection data 62 is incorporated into other data streams which might be delivered via other networks. The illustrative embodiment allows delivery of this content selection data in such a way that the entire broadcast remains backward compatible with existing receiver equipment. Also, because a default message is sent in-line with the regular broadcast, receivers that do not support personalization (i.e., do not have a software upgrade) will automatically show the default. Therefore, there is no reason to replace deployed receivers by personalized receivers when personalized transmissions start.

Another use for the additional data stream 50f is to provide audio, additional graphics, information, and transitional data. Audio requires much lower bandwidth than video, and therefore several different audio streams can be sent on one data stream, along with other data, and then buffered in the receiver (e.g., on RAM or hard-disk) for future playback.

Examples of transitions include fade-ins, fade-outs, morphs, and wipes between video segments, and cross fades between audio segments. These specific transitions (instead of clean cuts between segments) are occasionally wanted for artistic reasons. Transitions sometimes help in improving the flow of the message.

Transitional data sent over data stream 50f defines the transitions to be played when switching from one segment to the next. One option is transmission of transition instructions to the receiver, which then computes/generates the transitions either in software or using dedicated hardware. Another option, which requires less processing power in the receiver, is that the transitions are transmitted in MPEG-2 format, meaning that the transition video and audio streams are precomputed before transmission. The switch 59 may select the correct transitional segment to connect a previous segment with a next segment. As an example, the switch 59 Fig. 7 has three possible segments 70a, 70b and 70c, which are followed by three other possible segments 50a, 50b and 50c. There are a total of nine possible transitions between the first three segments 70a-c and the next three segments 50a-c. This is a simple combinatorial calculation, where the first segment 70a may be followed by one of three segments 50a-c, and the same for other first segments 70b and 70c. Therefore, the solution is to pre-encode all nine possible transitions, and provide them to the switch 59 in time to allow the switch 59 to select the proper transition to fill in between the

selected first segment 70 and second segment 50. The transitions are relatively small compared to the lengths of the segments being provided, therefore all the transitions may be provided over the one additional data stream 50f, and stored in a buffer until the correct transition is selected and inserted into the output data stream 60. The transitions between the first segments 70 and the second segments 50 may be provided during the time the first segment 70 is being passed through the switch 59, and kept in a buffer.

Alternatively, if there are sufficient available data streams 50, the transitions may each be sent by a different data stream 50, in a synchronized fashion with the regular segments, whereby the switch 59 does not need to collect and buffer the transitions ahead of time, but can simply select and switch to the proper data segment 70, wherein some data streams 50 include the segments, and some data streams 50 include transitions. The transitions are simply treated as other segments which go in a slot between the normal first selected segment and the next. In fact, since the transitions occur in between the segments, the data streams carrying the segments may be reused to include some of the transitions, while separate data streams only carry the transitions. Therefore, for the example of three data stream carrying three optional segments, with nine transitions, only nine data streams are needed to carry the simultaneous transitions, since the three segment data streams may also each carry one transition. Also, during the creative process it might be decided that certain transitions do not make sense from a story-telling perspective. In that case even less transition streams might be needed as some combinations of segments will never occur.

An alternate method for addressing the transition between segments is to make all segments 70 start and/or end in a similar manner. This would avoid the use of dedicated transition segments for changing between the other segments 70 and require no extra bandwidth.

An illustrative embodiment of a data transmission stream 56 coded as an MPEG-2 transport stream is shown in Fig. 8. The packets belonging to the multiple data streams 76 are labeled A-E. Packets A-D provide simultaneous delivery of a specific (e.g., video) segment, while packets E deliver extra information for example information for switching between segments, etc. Other packets 73 provide other channels or information typical to a multiplexed transport stream. Packets 73 can also be NIL packets. Just before the occurrence of a gap 69, there is a switch trigger 74, which may be in the form of a specially

coded packet, or a special flag encoded in another packet. The gap 69 (although depicted as empty) can contain any packets, such as NIL packets, or packets belonging to other information streams. After the gap 69, the data streams including the packets 76 continue as before. If fewer segments are needed for the next slot, for example only two optional segments are used for the next slot, then some packets 75 may be used to send other information, or are empty.

Fig. 9 shows the logical processing steps taken at the transmission side (e.g., in a cable head-end) to insert personalized messages into an MPEG-2 transport stream. In practice these steps are not necessarily in that order or may not even be recognized as individual steps. This depends mainly on the architecture of the insertion equipment and may vary from one set-up to another. Since incoming transport streams may carry several unrelated channels, the first step is to separate these channels to free up transport stream bandwidth necessary for the parallel insertion of the segments that are part of the personalized messages. The next step is replacing the existing ad (if necessary) with the main (default) choice of the personalized ad. After that the system according to this embodiment adds the additional choices (segments) for the personalized ad (third step) and adds the personalization information that informs the STB of the possible choices and timing (fourth step). Finally, since channels were removed from the transport stream and the personalization information was added, the PSI (program specific information, part of the MPEG-2 standard) is adapted to reflect the new situation (fifth step). This might include adding a private descriptor to the PMT (The Program Map Table, part of the PSI information) to signal the presence of personalized messages. Some of the SI/PSIP (DVB and ATSC extensions of MPEG-2) information might also have to be adapted to the new transport stream layout.

In one embodiment of the present invention, bringing the receiver 58 into the authoring chain requires changes to the software of the receiver 58. Components of the final television program are delivered to the receiver 58 and the receiver assembles the final program that best matches the personalization criteria. To a standard digital television receiver 58, the features of adding matching of profiles, switching to assemble the final content, and possibly reporting, are added. Fig. 10 shows a high-level overview of the software blocks of one example STB, including the modifications required for supporting

personalization functionality. The personalization engine 140, the Reporting and preferences application 142, and the middleware extension 144 are personalization specific.

The Personalization Engine (PE) 140 Fig. 11 is the heart of the slot based TV personalization within the STB. It controls the variant for each slot that will be shown to the viewer and will collect the viewing information for billing and personal tuning. The Personalization Engine 140 sits between the demultiplexer API and its client to intercept the settings for audio and video of the current channel and change them into the personalized versions. It uses the demultiplexer API to retrieve personalization control information/data, and to control the switching between the right media (audio and video) segments at the right time. To allow personalized text or graphics to be overlaid on the video, access to the low-level graphics API is also required. To the original client of the demultiplexer API it presents the same API, so that the client does not need changes in functionality. Depending on the graphics capability of the STB 58, the graphics API may be routed through the PE 140 in order to shut off any UI graphics for the duration of the text overlay or vice versa.

There is one extra bit of information that the PE 140 uses that is not typically available at this low level. This information is the PID of the personalization channel where the metadata (the information telling the receiver about the number and of slots, the PIDs for the slot-options, etc.) is transmitted. There are three possible solutions for this. In situations where the middleware has a high abstraction level compared to the HAL (Hardware Abstraction Layer) API, this information can be extracted from the PMT, which is typically parsed inside the OEM specific software. If the PMT is parsed in the middleware, there are two options, which are actually viable in all situations. The first is to double-parse the PMT: Capture the received PMT in the part of the PE that sits on top of the demultiplexer API and extract the information from this parse. There is no guarantee that the PMT requested by the middleware is the one that is actually used to play the current service, however, as the middleware might be pre-caching PMTs. The other way is to collaborate with the uplink part of the personalization chain and have a calculated PID assignment for the personalization channel. This can be either a fixed offset from a content PID or a fixed PID for every transport stream. In the future, middleware may be able to pass the personalization PID to the PE, similar to the way conditional access is nowadays integrated with middleware stacks.

The Personalization Engine 140, as part of its normal operation, creates a log of activity and viewing information for accounting and further customization. This information has to be delivered back to the central server on a regular basis. The way of delivering this information depends on the capabilities of the network and the STB 58. At a minimum either a cable modem or a PSTN modem will be present to allow the reporting facilities to work. Since these types of modems typically use some form of IP communication, and the middleware stack manages this communication link, it is probably the easiest to work through an application implemented on top of the middleware stack. Since one may also want to allow user preference settings, one can later extend the application with that functionality. For the user interface, the application can take full advantage of facilities offered by the middleware stack. Since most middleware stacks allow applications to be downloaded to the STB on the fly, the reporting and preference application can be updated with the latest features when necessary.

Whether or not an embodiment actually needs an application for reporting and preferences depends on the need to get the information to the server and on the need to allow users to influence their profile. If there is no need for any of these features, then the application will not be there. If only reporting is needed and there is a permanent link with the server by means of a cable modem, then the application will have no user interface.

In order to allow for last minute personalization for each individual receiver, rendering of extra information such as text, graphics, animations, synthesized audio and video is an attractive extra feature. The rendering result is subsequently overlayed over the broadcasted audio and/or video segments by the receiver. Rendering of text, graphics and animations can be done either at the transmission side (e.g., a head-end) or at the STB 58. If rendering is done at the transmission side, the resulting bitmap is placed in the broadcast transport stream and addressed to one specific STB. Because of bandwidth limitations, the rendered result cannot be overlayed with video at the transmission side; this has to be done in the receiver. If rendering is done in the STB, only the rendering commands have to be transferred. The STB should have sufficient rendering power to allow for this option. For both options, the STB must have sufficient graphics capabilities to support rendering with the required number of colors and resolution. For animations, even more processing power is required.

Graphics rendering on the STB is a difficult functionality. The STB resident software is likely to make use of the same graphics plane of the STB hardware as is required for displaying the rendering results for personalization. The most portable option is to go through the middleware software of the STB, but this may cause timing problems with the real-time (frame accurate) behavior of personalization overlays. The functionality of the overlay handling will need to be placed at a fairly low level within the STB software, and executing calls to the middleware API from this level may likely introduce reentrancy problems within the middleware stack. Also, most middleware APIs can only be called from applications running on top of the middleware, which is unsuitable for the real-time text/graphics overlay functionality. However, if the system does not use the middleware graphics or text capability for the text overlays, there may be a resource conflict with the use of the graphics hardware. This conflict can be resolved in several ways:

Make use of separate graphics hardware planes for overlay and middleware. This is obviously only feasible if the hardware contains at least one hardware graphics plane that is not used by the middleware.

Create virtual graphics planes. This would require a relatively large amount of extra memory for buffering of overlapped graphics information. The code would also need to be multithreading safe since both the middleware and the overlay processing will be making graphics API calls. It would provide the same level of functionality as the multiple hardware planes, but may affect performance.

Disable the overlay graphics for the duration of the user interface graphics display. This may be difficult to build. There will be a difficulty in predicting when there is no relevant user interface activity going on. There may be permanent graphics on the screen to signal channel numbers or other information. A better version of this may be to detect if the overlay area contains any non-transparent graphics and, if not, allow the overlay to proceed. As soon as UI graphics is displayed in the area, the overlay must be removed.

Disable the user interface graphics for the duration of the overlay. This is probably the least acceptable option because the user of the STB will not want his visible information to disappear just because a commercial in the background wants to do some text overlay. However, it is the easiest option to predict, since the exact timing of the overlay graphics is known in the personalization engine. It may still require some buffering to allow a restore of

the UI graphics once the overlay disappears.

An element in letting the receiver do the final assembly of personalized messages, as just described in a specific embodiment of the present invention, is the protocol between the transmitter and receiver that allows the receiver to do the final assembly of personalized messages. This so-called broadcast protocol defines how content material and associated metadata and control messages have to be multiplexed into MPEG-2 transport streams. It is an extendable protocol framework designed to be backward compatible with existing digital broadcast.

In order to allow reliable hardware independent switching between slots of the broadcast, the present invention allows one to specially format the transmission of the content data of the main and alternative channels. This is helpful because of the buffering mechanisms used in digital receivers 58, as illustrated by Fig. 12. This buffering, together with the multiplexing of MPEG-2 transport streams make it difficult to reliably switch between different content streams within the transport stream without visible or audible artifacts. In order to circumvent this problem, it is helpful to have a period of silence, or gap, 69, Fig. 8 in the data stream at the switching point. Due to the multiplexing techniques used in an MPEG-2 transport stream, it is possible to create such a gap in the content flow. Sending more information ahead to fill the buffers in the receiver to a higher degree achieves this goal. During the gap in the incoming data, the receiver will continue to process content from the buffer and the de-multiplexing circuitry can be switched safely to one of the alternatives, after which the content flow will continue from the new source.

Fig. 13 illustrates the resulting data stream 58 layout. In this case the content selection information added by the personalization application consists of the indicated SIM (Sequence Identification Message) 90, SOM (Sequence Option Message) 92 and SEM (Sequence End Message) 94, while the switch point trigger message is indicated by the SPM message 96. In this example the personalized ad comprises two slots 98, which have multiple choices of media data (e.g., video), and are preceded by gaps 69 to allow for switching time to an appropriate media data segment. The transport stream 58 shown indicates a personalized message inserted into a main program while that main program is the only one present in the transport stream 58.

By means of roadblocking the same personalized message could be used for multiple programs transmitted in the same transport stream. Roadblocking is used in television broadcasting, and means that different television channels are broadcasting commercials at approximately the same time. This is done to ensure that channel changing (zapping) consumers will remain seeing commercials, despite their zapping. This will obviously ensure that consumers cannot zap away from commercials to TV programming; they will always zap between commercials.

A generalization of this approach is roadblocking with the same commercial, meaning that during zapping, consumers will see the same commercial at approximately the same time.

In the present invention, roadblocking goes one step further, meaning that all television channels in one transport stream are aligned such that they switch to the same personalized commercial at the exact same (video and audio) frame. This type of roadblocking ensures zero overhead in bandwidth in the specific transport stream due to personalization of commercials. The transport stream can contain exactly the same number of commercials as a situation with non-personalized commercials.

Detail of various protocols for the illustrative embodiment will now be provided. The broadcast protocol messages that are sent over the Meta Information Stream (cf. 50f in Fig. 7), have at least indications of a personalization message or an overlay message. These broadcast protocol messages are sent as PES packets or MPEG-2 sections (e.g., private data sections). The personalization protocol is an extension of the Broadcast Protocol, designed to allow content selection and assembly by the receiver 58 based on transmitted personalization information through the personalization protocol messages. The personalization protocol assumes that the STB has the user profile necessary to make the selections from the content information. The personalization protocol claims a message type and defines a message framework for all messages belonging to the personalization protocol, each identified by a message subtype. The personalization protocol covers the following messages:

Sequence Identification Message (SIM) 90

This message indicates the start of a personalization sequence. It assigns an identifier to the sequence, which will be used to identify the other messages belonging to the sequence. It also identifies the PIDs (streams) used for the personalized sequence. It also contains (optional) fields for copyright and authoring information.

Sequence Option Message (SOM) 92

This message announces an upcoming personalization switch point. It identifies the possible options, along with the selection criteria that drive the final selection. The message is linked to the sequence by means of the sequence identifier.

Switch Point Message (SPM) 96

This is an optional message following the SOM, which signals the actual start of the content gap that allows the switching of the decoder hardware to the new setting. It is linked to the sequence by means of the sequence identifier.

Sequence End Message (SEM) 94

This message signals the end of the entire sequence. After this message the sequence identifier is no longer valid and may be reused. The message is included for accounting purposes and is linked to the sequence by means of the sequence identifier.

A viable alternative to embedding the personalization media segments and control messages into the same transport stream as the TV program/channel the message is inserted into, is providing it via a different transport stream. In this alternative embodiment of the present invention, the receiver switches to the other transport stream at the moment the personalized message is to be played. This is typically indicated by a trigger message in the TV channel. Upon receipt of this trigger (which may contain the id of the transport stream to switch to), the receiver switches to the transport stream containing the personalized messaging content and metadata. At the end of playing the personalized ad, the receiver switches back to the transport stream containing the TV program. Depending on the

capabilities of the receiver, the switch between transport streams might or might not be completely seamless. In case the hardware doesn't allow a seamless switch, the switch can be camouflaged, e.g., using a fade, a number of black frames, or using some rendered graphics. The broadcast protocol itself, as well as the personalization protocols do not need to be changed in this alternative embodiment.

A major advantage of this alternative embodiment is the saving in bandwidth when many personalized messages are broadcasted, divided over many different TV channels. Thus, the personalized messages can be concentrated in one (or a small number) of separate transport streams which can be completely filled with personalized messages (depending on the distribution in time). It can easily be seen that this leads to much less use of bandwidth compared to inserting the personalization messages into the same transport streams as the TV channels they become part of.

Yet another alternative embodiment of the present invention is a situation where the TV channel in which the personalized message will be played is analog instead of digital. In this situation the ad's media segments and control messages are, again, conveyed in a separate (digital) transport stream. In this embodiment, the analog TV channel will contain triggers (typically embedded as data in the VBI - Vertical Blanking Interval) that trigger the receiver to switch over to the digital transport stream containing the personalized message. This alternative embodiment would work in most current digital set-top boxes as these are usually also capable of playing/decoding analog television. The attractiveness of this embodiment is that this enables personalized ads in analog television channels. Again, depending on the receiver's hardware, the switches from the analog channel to the ad in the digital transport stream and back might or might not be seamless, depending on the specific capabilities of the hardware in the receiver. Typically, receivers with dual tuners will be capable of performing a seamless switch. In single tuner systems a camouflage similar to the one mentioned above might be employed to cover potential switching artifacts.

The overlay protocol also is an extension of the broadcast protocol. It is used to distribute text and graphics messages that must be overlaid on top of the video. It registers a message type and defines a Content Data framework message for the different overlay protocol messages. Overlay protocol messages can be targeted at a specific receiver by means of a unique receiver address. In order to identify the personalization option video that

the overlay belongs to, the video channel is identified. A subtype identifies the type of overlay data that the message contains. The following subtypes are covered:

Text overlay message.

This is a fixed text string to be overlaid on the video at the specified time and screen location. It allows font specification within the limits of the font capabilities of the personalization engine.

Tagged text overlay message.

This message is similar to the text overlay message, but the text may contain tags that are replaced with local information by the receiver. This allows the text string to be personalized with data that has been downloaded into the receiver.

Graphics overlay message.

This message is used when the rendering of the text has been done at the transmission side (i.e., the message is a bitmap), or when the overlay contains graphics.

In order to allow accounting of the actual viewed material, the STB needs to keep track of the personalized content that has been shown to the viewer. For this reason, the personalization engine typically keeps track of the paths chosen through the personalized content. This information can be transferred to a central server in some way. Unless this is done through a permanent connection, the information is stored on the STB between two accounting reporting moments. There are several options for this storage, including storage in RAM, NVRAM or physical media, etc.

If the STB has a hard drive, that can be used for non-volatile storage of the accounting information. The amount of information is very small, compared to video storage, so the capacity of a typical hard drive will be sufficient for long-term storage.

Another option is Smart Card storage. Storing the accounting information on a Smart Card allows physical retrieval of the information. The Smart Card could also be used to store the user profile information. The update of the user profile on the Smart Card could be done at the same time as the retrieval of accounting information from the Smart Card.

The amount of storage available depends on the Smart Card and should be enough for accounting purposes. One problem with this solution might be that a Conditional Access Smart Card, which cannot be used for the purpose of accounting, occupies the available Smart Card slot.

Details for options for distribution of the user profile information to the STBs will now be presented. While typically one option is chosen for a specific network, each network may need to choose a different option because of differences in STB capabilities.

One option is Broadcast carousel, since there will probably be a significant amount of bandwidth available between the customization slots, that bandwidth can be used to distribute the user profiles to the receivers. The user profiles are transmitted cyclically in a database distribution carousel that carries the User Profiles of all receivers on that part of the network. In a cable network this is possible, since the number of users is limited. In a satellite network the amount of information may be so big that the repeat rate would become too low. If the repeat rate is high enough, there may not be any need to store the profile in non-volatile memory in the STB.

Another option is overnight broadcast carousel. If the available bandwidth during peak hours is not high enough, the broadcast of the profile carousel can be moved to a low traffic time, if that is available. It can also be moved to a separate transport stream, and the STB can tune to that automatically if the user was not using it. This method may require non-volatile storage of the User Profile on the STB.

Another option is a permanent direct connection. Since an STB with personalization capabilities needs some way to retrieve the accounting information about the personalized TV content, there may be some form of communication with the server. This may be a cable modem with a permanent connection to the head-end. If that is the case, the STB can request the User Profile when necessary, and the server could signal the STB of an update in the profile. In this situation, there is no need for non-volatile storage of the User Profile in the STB.

Similar to fulltime direct connection, is direct dialup connection. The connection needs to be established each time it is needed. This means that there is no reliable way for the server to signal the STB of an update in the profile. It also means that the profile must probably be cached in non-volatile memory on the STB. It is acceptable to have the STB

dial-in every time it is powered on, or at least once a day to receive the latest profile. That way non-volatile storage would not be required.

Finally, it is possible to transfer the user profile via physical distribution. This would likely be a form of smart card distribution. Physical distribution does not allow frequent updates of the user profile, but it does allow the system to work, even when no other communication channel was available. The Smart Card is also used for accounting, and may include some incentive to get the users to return the smart card. This method could be used for small-scale trial runs.

Although the present invention is described with embodiments specific to MPEG-2, the present invention may be used by any type of data transmission system, including analog and digital broadcasting, cable, cellular, satellite and terrestrial broadcasts, Video on Demand, Digital Versatile Disc (DVD), Internet, internet streaming video, ethernet, wireless, ATM, MPEG (including MPEG 1, 2, 4 and variations thereof), AC3 etc.

Although the invention has been shown and described with respect to illustrative embodiments thereof, various other changes, omissions and additions in the form and detail thereof may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

CLAIMS

1. A method for allowing the creation of a plurality of personalized messages comprising:

creating a personalized message template comprising a plurality of slots in sequence, wherein at least one of said slots can include one of a plurality of different segments, with all segments for a particular slot being a same length;

providing a plurality of data streams to a receiving unit, each data stream delivering a different one of said plurality of segments for said at least one slots, wherein said segments are synchronized to begin and end at substantially the same time;

providing content selection information regarding content of said plurality of data streams to said receiving unit, said information including switch times for said plurality of synchronized segments, to allow said receiving unit to select among said plurality of data streams for one of said segments for said particular slot, to assemble a personalized message.

2. The method of claim 1 wherein said receiving unit selects among said plurality of data streams in real time.

3. The method of claim 1 wherein said personalized message is viewed by a viewer as it is assembled.

4. The method of claim 1 wherein said receiving unit selects among said plurality of data streams based on said content selection information and information about a viewer who will view said personalized message.

5. The method of claim 4 further including providing a data stream with a default personalized message to allow said receiving unit to display said default personalized message without selecting between said plurality of data streams.

6. The method of claim 1 wherein said plurality of data streams are MPEG encoded data streams.

7. The method of claim 1 wherein said plurality of data streams are multiplexed into a transport stream.

8. The method of claim 1 wherein said segments are incomplete parts of a personalized message.

9. The method of claim 1 wherein said receiving unit is a set top box.

10. The method of claim 9 wherein said set top box can receive both analog data streams and digital data streams, and wherein said set top box momentarily switches from an analog data stream to a digital data stream to play out a personalized message.

11. The method of claim 10 wherein said set top box switches from an analog data stream to a digital data stream triggered by VBI data.

12. The method of claim 9 wherein said set top box momentarily switches from a first digital data stream to a second digital data stream to play out a personalized message.

13. The method of claim 9 wherein said set top box receives a plurality of television channels over said data streams, and said channels include programs including a synchronized commercial break; and

during said synchronized commercial break; said data streams deliver segments to create a personalized message for display irrespective of which channel said set top box had selected.

14. The method of claim 1 further including transition segments, which are inserted into said personalized message between said segments.

15. The method of claim 1 further including a plurality of templates for creating said personalized messages, wherein said templates include video sequence templates and audio sequence templates.

16. A system for distributing a plurality of multimedia personalized messages to a plurality of end users, said system comprising:

a personalized message template comprising a plurality of slots in sequence;

a plurality of media segments for said slots, wherein at least one of said slots can include one of a plurality of different media segments, with all media segments for a particular slot being a same length;

a plurality of data streams transmitting said media segments, wherein said plurality of data streams transmit all media segments for one of said slots in at a same time, and wherein one of said data streams transmits content selection information regarding content of said plurality of data streams said information including switch times for allowing a receiving unit to switch among said plurality of data streams to select a particular media segment at a particular time, to assemble said personalized message.

17. The system of Claim 16, wherein said receiving unit switches between analog data streams and digital data streams to assemble said personalized message.

18. The system of Claim 16 wherein said receiving unit switches between a first digital data stream to at least one second digital data stream to assemble said personalized message.

19. A system for distributing a plurality of multimedia personalized messages to a plurality of end viewers, said system comprising:

a means for creating a personalized message template with plurality of slots;

a means for creating a plurality of media segments, said media segments for use in said slots;

a transmission means for transmitting said media segments, wherein said media segments for a particular slot in said personalized message are transmitted at a same time;

a means for providing content information to allow a receiving unit to select one of said media segments at a particular time, to assemble said personalized message.

20. A method for delivering a plurality of different messages over a television transmission network, comprising:

creating a plurality of different media segments, wherein said different media segments include incomplete sections of a complete message, and wherein at least one subset of said media segments are a same length;

transmitting said plurality of different media segments to a television signal receiver, wherein all media segments in said at least one subset are transmitted simultaneously;

directing said television signal receiver to switch to one of said media segments in said subset as said media segments in said subset are received.

21. A method for delivering a plurality of different messages over a television transmission network, comprising:

creating a plurality of different media segments, wherein said different media segments include incomplete sections of a complete message, and wherein at least one subset of said media segments are a same length;

transmitting a plurality of television programs to a television signal receiver, wherein said plurality of television programs have at least one synchronized commercial break;

during said synchronized commercial break, transmitting said plurality of different media segments to said television signal receiver, wherein all media segments in said at least one subset are transmitted simultaneously;

directing said television signal receiver to switch to one of said media segments in said subset as said media segments in said subset are received; and

wherein after said synchronized commercial break, said television signal receiver switches to a previously selected television program.

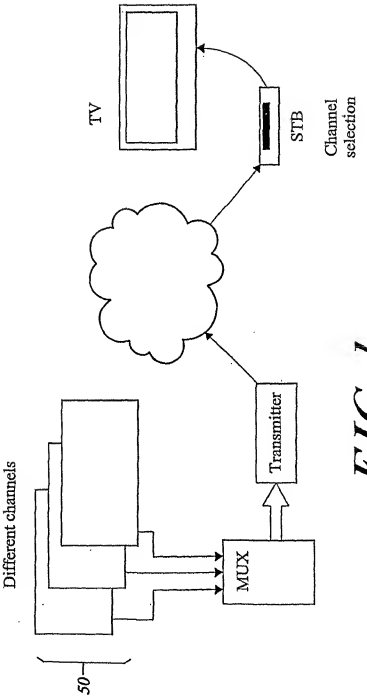

FIG. 1
(PRIOR ART)

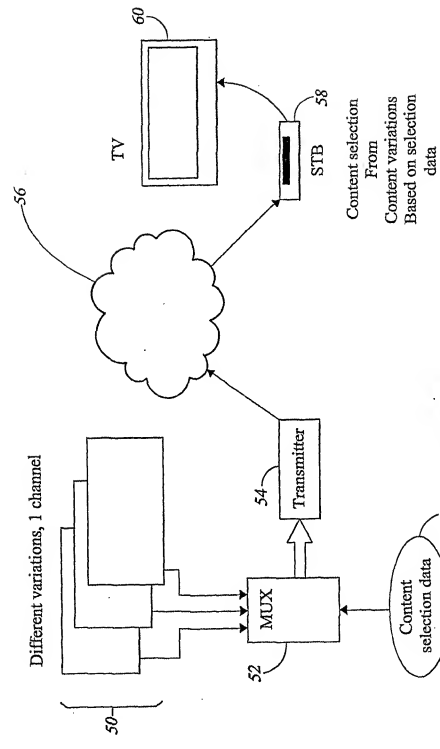
Different variations, 1 channel
50
MUX
52
Transmitter
54
Content selection data
62
56
TV
60
STB
58
Content selection From Content variations Based on selection data

FIG. 2

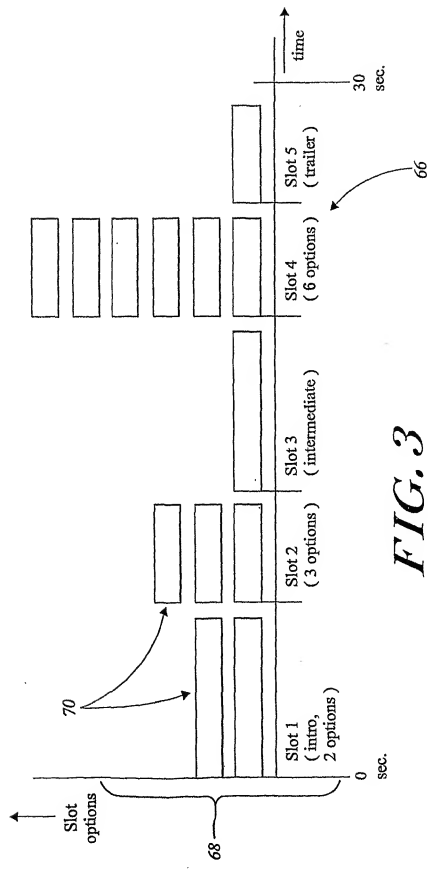
64
Slot options
68
70
Slot 1 (intro, 2 options)
Slot 2 (3 options)
Slot 3 (intermediate)
Slot 4 (6 options)
Slot 5 (trailer)
66
0 sec.
30 sec.
time

FIG. 3

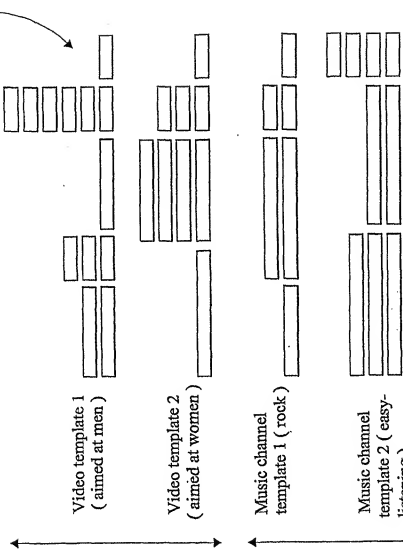
70
72
Templates for video
Video template 1 (aimed at men)
Video template 2 (aimed at women)
Templates for background music channel
Music channel template 1 (rock)
Music channel template 2 (easy-listening)
Templates for voice-over channel
Voice-over channel template (english, spanish)

FIG. 4

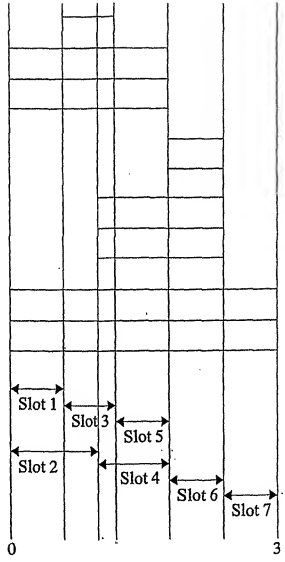

FIG. 5

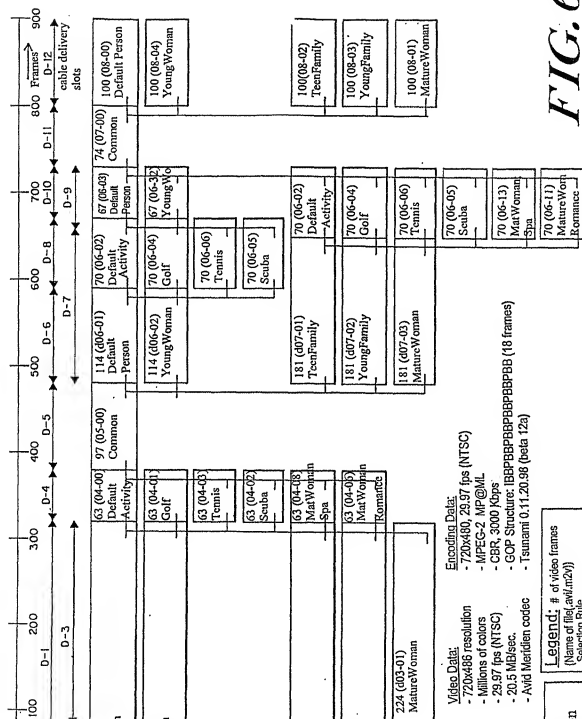
0
100
200
300
400
500
600
700
800
900
Frames
D-1
D-2
D-3
D-4
D-5
D-6
D-7
D-8
D-9
D-10
D-11
D-12
cable delivery slots
315 (d01-01) Default Person
315 (d01-02) YoungWoman
315 (d01-03) TeenFamily
315 (d01-04) YoungFamily
91 (01-02) Mature Woman
91 (01-04) MatureWom Spa
63 (04-00) Default Activity
63 (04-01) Golf
63 (04-03) Tennis
63 (04-02) Scuba
63 (04-08) MatWoman Spa
63 (04-06) MatWoman Romance
224 (d03-01) MatureWoman
97 (05-00) Common
114 (d06-01) Default Person
114 (d06-02) YoungWoman
181 (d07-01) TeenFamily
181 (d07-02) YoungFamily
181 (d07-03) MatureWoman
70 (06-02) Default Activity
70 (06-04) Golf
70 (06-06) Tennis
70 (06-05) Scuba
70 (06-05) Scuba
70 (06-13) MatWoman Spa
70 (06-11) MatureWom Romance
67 (05-03) Default Person
67 (06-32) YoungWo
74 (07-00) Common
100 (08-00) Default Person
100 (08-04) YoungWoman
100(08-02) TeenFamily
100 (08-03) YoungFamily
100 (08-01) MatureWoman
Video Data:
- 720x486 resolution
- Millions of colors
- 29.97 fps (NTSC)
- 20.5 MB/sec.
- Avid Meridien codec
Encoding Data:
- 720x480, 29.97 fps (NTSC)
- MPEG-2 MP@ML
- CBR, 3000 Kbps
- GOP Structure: IBBPBBPBBPBBPBBPBBPBB (18 frames)
- Tsunami 0.11.20.98 (beta 12a)
Delivery Slot-Option
Legend: # of video frames
[Name of file].avi(n2d)
Selection Note

FIG. 6

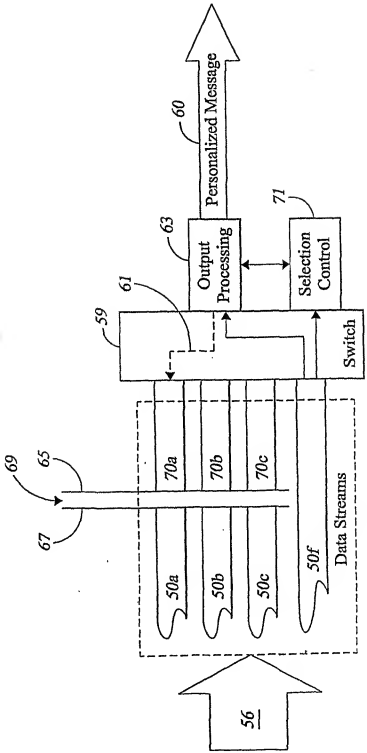
56
Data Streams
50a
50b
50c
50f
65
67
69
70a
70b
70c
59
61
Switch
63
Output Processing
71
Selection Control
60
Personalized Message

FIG. 7

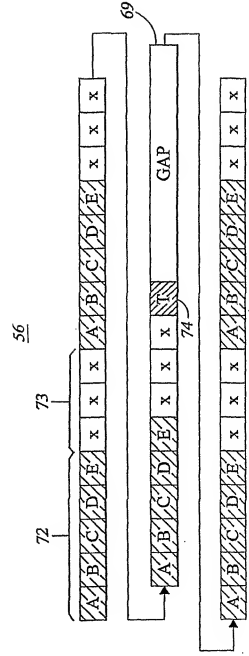

FIG. 8

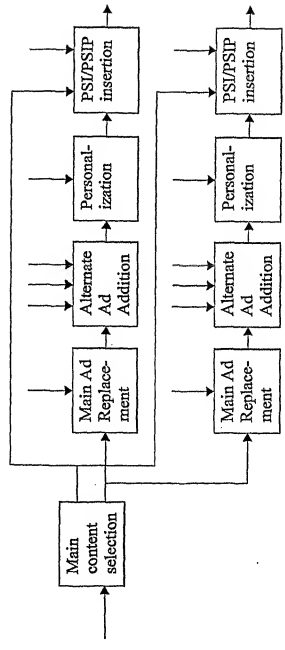
Main content selection
Main Ad Replace-ment
Alternate Ad Addition
Personal-ization
PSI/PSIP insertion
Main Ad Replace-ment
Alternate Ad Addition
Personal-ization
PSI/PSIP insertion

FIG. 9

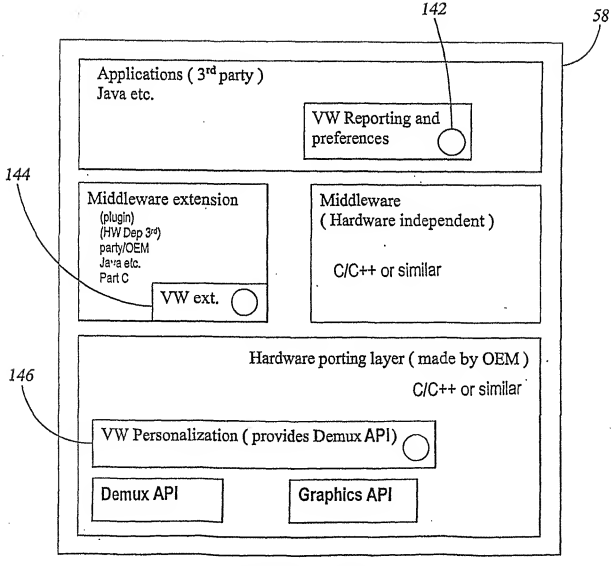
142
58
Applications (3rd party)
Java etc.
VW Reporting and preferences
144
Middleware extension
(plugin)
(HW Dep 3rd)
party/OEM
Java etc.
Part C
VW ext.
Middleware
(Hardware independent)
C/C++ or similar
Hardware porting layer (made by OEM)
C/C++ or similar
146
VW Personalization (provides Demux API)
Demux API
Graphics API

FIG. 10

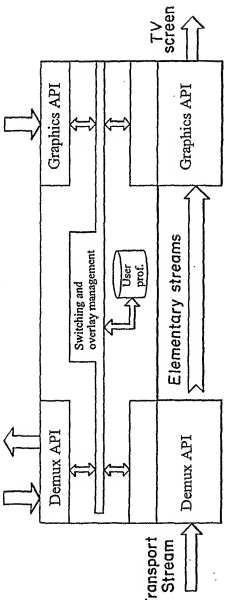
140
Transport Stream
Demux API
Demux API
Switching and overlay management
User prof.
Elementary streams
Graphics API
Graphics API
TV screen

FIG. 11

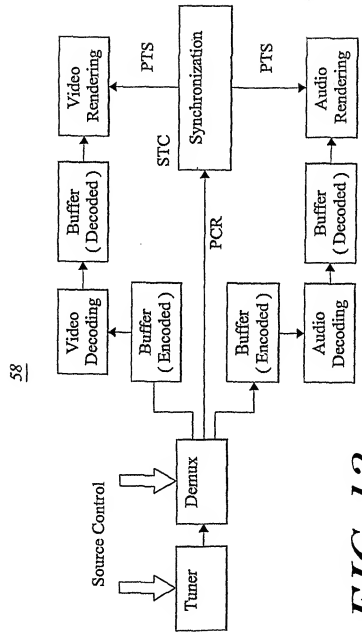
58
Source Control
Tuner
Demux
Video Decoding
Buffer (Encoded)
Buffer (Encoded)
Audio Decoding
Buffer (Decoded)
Buffer (Decoded)
Video Rendering
Audio Rendering
PCR
STC
Synchronization
PTS
PTS

FIG. 12

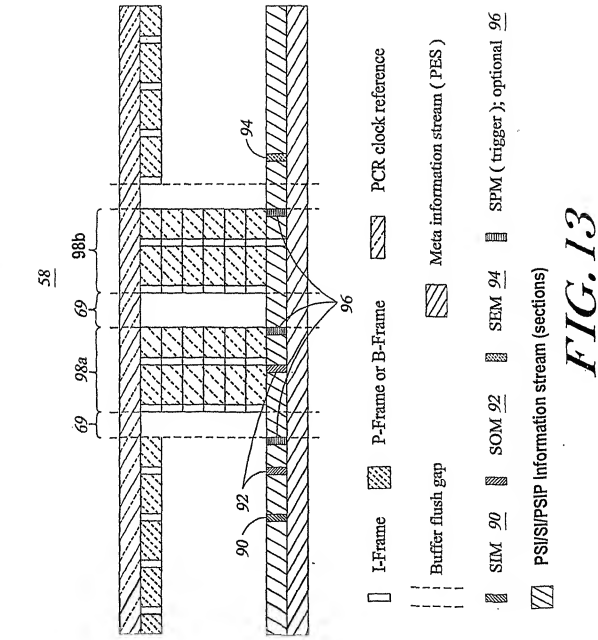
58
69
98a
69
98b
90
92
94
96
I-Frame
P-Frame or B-Frame
PCR clock reference
Buffer flush gap
Meta information stream (PES)
SIM 90
SOM 92
SEM 94
SPM (trigger); optional 96
PSI/SI/PSIP Information stream (sections)

FIG. 13

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 725/34, 136, 138, 139

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 725/32, 34, 135, 136, 138, 139

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,774,170 A (HITE et al) 30 June 1998, see whole document.	1-21
X	US 6,002,393 A (HITE et al) 14 December 1999, see whole document.	1-21
A	US 5,585,858 A (HARPER et al) 17 December 1996, see whole document.	1-21
A	US 6,029,045 A (PICCO et al) 22 February 2000, see whole document.	1-21

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

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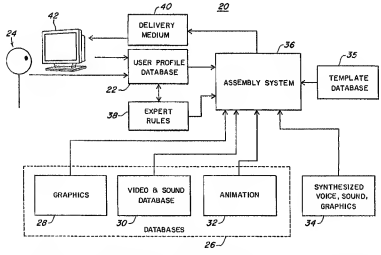
(54) Title: SYSTEM AND METHOD FOR PERSONALIZED MESSAGE CREATION AND DELIVERY



(57) Abstract: A system and method for dynamically creating individualized, multi-media messages and to deliver the messages to specific target groups or individual viewers. A message, story, or advertisement is assembled on demand, based upon rules applied to each viewer's profile and a library of media segments. The framework for the final personalized message is a story or message template designed for a campaign. A set of viewer profiles is assembled from designated databases for each of the targeted entities. A collection of media segments is also created or selected and then made available to produce the final personalized message at assembly time. Specific media segments are selected and merged according to the message template and information about the viewer derived from each viewer's profile. The information from the viewer profile is interpreted by a rule system to determine which of several potential media segments to select for use in the personalized message. The merged composite is then encoded to match the distribution media and forwarded to the viewer.

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SYSTEM AND METHOD FOR PERSONALIZED MESSAGE CREATION AND DELIVERY

FIELD OF THE INVENTION

This invention is directed towards video and media creation, and more particularly towards a system for creating individualized messages based on user information.

BACKGROUND OF THE INVENTION

Marketers have come to rely on demographic solutions to establish patterns and trends about the purchasing habits of their customers and how these habits relate to media purchases, demographics, and other factors. Alongside companys' proprietary databases, third party data warehouses have evolved, fashioned by many companies who share information either about specific customers or about data extracted from their customer bases. In both cases, advertisers use the derived information to generate observations relating to their markets, target individuals to different types of offerings and select appropriate media purchases for advertising.

In the case of video advertising media, e.g., video tapes that are mailed, internet video streams, or broadcast or cable advertising – there are only limited means to produce personalized versions of the advertisements or direct marketing information that directly takes advantage of the information available about consumers purchasing habits and the like. Mostly, this reflects the nature of the traditional delivery media for video, which, until very recently, provided very limited capability to deliver anything more than a common message. As such, even though companies know a tremendous amount of information about their customers, the ability to leverage this information has been limited by the fundamentals of the broadcast medium, requiring a like message to be sent to all customers. Additionally, the nature of video production, focused typically on one product, does not allow for incremental content changes. This forces advertisers to avoid topically relevant information and offerings.

An early attempt to merge the power of real-time television with the information content of the Internet is disclosed in U.S. Pat. No. 5,778,181, Hidary, et. al., dated July

7, 1998 (the '181 patent), in which a user is presented with a video along with related Internet information. A user has a personal computer connected to two signal paths: a video signal and a second separate connection to the Internet for receiving Internet information. To use the described system, the video producer needs to first create the video, encode the Internet addresses (or URLs) of web pages, and then distribute the composite information. A limited portion of the vertical blanking interval (VBI) of the video signal is encoded to deliver the URLs. The client software retrieves and decodes URLs from the video program. These URLs are interpreted, and direct the web browser software to retrieve web pages. The web pages are synchronized to the video content for display. Alternatively, the encoded video signal could be simultaneously routed to a specialized server that decodes the URLs, contacts the addressed Internet server, and directs the server to send the designated web pages via the Internet to the user's PC where they are then displayed. Among the disadvantages of the system such as described, is that the video and corresponding web content are static and defined by the video producer during production. The same URLs are sent to every viewer of the same video. There is no change to the content of the video according to any real-time understanding of the viewer. Similarly, no mechanism is described for changing the content of the web pages in real time either, even if the server somehow obtained information about the preferences of the viewer.

A somewhat selective system is described in Abecassis, U.S. Pat. No. 5,717,814, issued Feb. 10, 1998. The system in the '814 patent includes a capability for a more individualized control over the contents of a requested video program. Segments, or clips, of a video scene are first evaluated and rated according to criteria such as the amount of violence, nudity, or profanity, as well as other criteria related to other elements of the clip (location, time, detail, etc.). Each clip is associated with a record containing keywords related to the subject matter, such as "flag burning," that a user may prefer not to see. A series of clips (a "program") is then mapped into a series that constitutes the presentation when viewed in sequence. During run-time, the actual series of clips shown are selected from the library of clips according to the user's preferences. Thus, a viewer might decide to watch a condensed version of a movie without any gore while another viewer may prefer a lengthier version with gore but not profanity. A producer and

director can also create multiple versions of important scenes that will be viewed according to the viewer's preferences. As the price of such user-selection, this system not only requires the producers initially to rate, key, and map each segment in a movie according to the various parameters, but also requires a specialized viewing system that can translate the viewer's preferences into the proper selection and mapping criteria for properly sequencing the optional segments during the playback. For example, a specialized laser-disk unit would be programmed to play a specially encoded disk according to the viewer's desires. In a wideband network context, the transmission system would first upload user preferences, omit non-conforming clips, and create the resulting download movie. In any case, the result is a pre-selected set of clips, as a function of the user preferences, that will be played in sequence for the viewer. The creation and inclusion of clips in the program must necessarily precede consideration of the user's preferences. The viewer is not really interacting with the producers, but only the machine making the selection of pre-selected clips. No "new" materials are selected or incorporated into the show during viewing – only "old" materials that have been pulled together as a function of the user's selected preference. Thus, nothing is "created" specifically for the viewer.

A somewhat more interactive solution is described in Freeman, U.S. Pat. No. 5,861,881, issued Jan. 19, 1999, in which a user interacts with a computer to determine which of several cable TV or other audio-visual inputs will be displayed on the screen at any given time. Stored user commands determine which of the multiplexed signals will be selected, and specialized hardware "seamlessly" switches between video channels, such that the user cannot perceive the switchover (other than the change of content). For example, at the start of a sports program, the user can select the preferred language of the audio segments, and whether on-screen graphics (e.g., player statistics) should be displayed. These inputs can be used to insert scheduled "trigger points" into the video or digital program which are later used to select the audio-visual combinations preferred according to inputs by the user. When a trigger point is played, the computer system selects a different video segment, graphic, or audio segment, either from alternate channels, or from a database of such segments downloaded to the computer on a second communication channel (either in parallel with the primary transmission, or on CD-ROM,

or at some other time). As with other versions of this approach, the user must intentionally interact with the program to select the preferences. Also, the only selectable segments are those produced as part of the program. There is no real-time search for or compilation of new materials. The user preferences are only evaluated according to the pre-selected criteria that correspond to segment selections. Each video segment is either played or not played; but the video segment itself is not modified according to any user inputs.

The television industry's reaction to the limitations of broadcast medium has been "localism," that is, an attempt to target audiences by demographic, geographic and psychographic means. Localism reflects market generalizations, often derived from actual profiles and data. Localism is offered in the broadcast forum by buying placements in geographic areas. On cable this can be a neighborhood. On specific television shows it can be via reflecting certain viewer preferences according to demographics, or times of day. The results have left advertisers, who pay by the "eyeball," dissatisfied with the expediency of their advertising dollars. The cable television industry, in an attempt to respond to these shortcomings and to distinguish its offering from broadcast, is deploying addressable advertising systems which allow advertisers to purchase individual households or even single set-top boxes for their ads, allowing, when combined with household profiles, an extremely fine grain of targeting to reach the appropriate viewers.

This form of targeted or addressable advertising, is similar to the capabilities now found on some Internet services, where single viewers based on their profiles can be targeted with banner ads and interstitials or email. At the same time, Internet advertising is increasing its use of rich media (defined as 20-Kbytes/sec or above), in an attempt to create the type of powerful and effective images we associated with television advertising. Sometimes because of bandwidth limitations and often because of a mistaken philosophy, these ads necessitate consumer interactions. The result, in contrast to television advertising, forces the consumer to interact, distorting the media's capability to deliver a message.

As a means to improve on targeting, designers of Web based offerings began to employ personalization solutions. On the Internet, where many traditional factors

associated with purchasing decisions become less relevant, the ability to establish a one to one relationship with a consumer is paramount. Similarly, it is most desirable to offer, if possible, service and products reflecting that one-on-one relationship. To cite an example, Dell Computer allowed customers to build their own computers (mass customization) on the Web, instead of pre-building several different models for different target markets (targeting). Dell and other companies employed sophisticated customer relationship management (CRM) solutions based on general and proprietary technologies.

These CRM solutions, based on a variety of existing technologies, personalize offerings by using a combination of information gathered from the consumers visiting web sites. Such information is typically gathered by asking questions, tracking navigation and purchasing behavior, as well as from information gathered elsewhere.

Yet another step in the enhancement of advertising has been taken recently, as reported in the press. For example, Enliven of Waltham, MA, offers real-time, database connection capabilities that let advertisers present up-to-the-minute information in Enliven-activated ads. Advertisers can present live information from a database source to a consumer viewing the ad with a proprietary, Java-based viewer. When merged with a marketing database such as TrueMatch, profile-based ad campaign targeting becomes possible. An advertiser creates a template into which graphics and text are inserted, according to the demographic information available about the user. However, even with the additional consideration of demographic information for real-time selection of advertising components, the templates provide a limited capability to effect enhanced advertising. This known system does not include any capability to modify or incorporate video materials into the advertisements, thus depriving the advertisers of the rich menu of video-oriented raw materials from which to draw. This leaves the viewer with little more than an interactive banner ad, perhaps with primitive "effects" that happens to have been "tailored" for publication to that user. There is no capability to change the tempo, music, narration, lighting, or any other elements of the advertising that have been proven successful in gaining the viewer attention the advertisers desire.

Further, even with known interactive personalization solutions in place, text and graphics solutions cannot compete with the masterful ability of video and audio to generate interest, create brand awareness, or product image. Television advertising

agencies are master storytellers, using the types of narrative that people respond to so well. Although the Internet is a powerful medium on which to personalize dynamic offerings it lacks the power of traditional television which uses the richest of media to present powerful 30-second stories. The Internet is, by form, an interactive media, with the user typically controlling the type of message received. If the user can control the media message, either through explicit commands about what type of information the user reveals, or alternatively what information the user receives, the power of narrative story telling to a passive and receptive audience is lost.

SUMMARY OF THE INVENTION

The present invention is directed towards a system and method for dynamically creating individualized, multi-media messages for delivery to an intended audience, which can be specific groups or individuals. A message, story, or advertisement is assembled on demand, based upon rules applied to each user's profile data and the available library of media segments. The narrative framework for the final personalized message is a story as defined by a message campaign. The message campaign includes a message template and a collection of media segments. The media segments are selected and then assembled to produce the final personalized message at assembly time. Specific media segments are selected and merged according to the message template and information about the viewer derived from a user profile. The information from the user profile is interpreted by an expert rule system to determine which of several potential media segments to select for use in the personalized message. The merged composite is then encoded to match the distribution media and forwarded to the user for viewing.

Although the operation of the present invention includes the ability to assemble and convey a message upon demand, an advantage is the ability to match the presentation options with an educated and timely assessment of the target audience according to a number of templates. A campaign plan defines what the target group is (entity qualification), and what individual viewer information is relevant (entity profile) for target entities within the target group. Additional factors include the selection of input databases, target distribution channels, and environmental factors (weather, current interest rates, etc.). A message resource library contains the collection of video, audio,

and other elements necessary to assemble the whole range of different messages based upon the message template. Message library resources include not only the varied clips necessary for each selection point of the template, but also variations triggered by changes in the monitored environmental factors, as well as synthesized speech and visual constructs to meet individual profile requirements.

Assembly of the message according to the present invention is based upon a message template which embodies the rules for selection and combination of the most current message library resources according to the entity profile at the scheduled time of message production. The present invention allows automated dynamic message assembly at any point up to seconds before delivery, based upon entity and environmental factors that are in constant flux, yet combined in a manner that addresses the communicative objectives of the campaign. A master task scheduler is defined according to the campaign requirements to control and coordinate all activities of the creation of the viewer profiles, message resource library, and message assembly.

The present invention includes the ability to edit and use scene or segment substitutions, choice of narrators and language, music changes or substitutions, audio effects, text and graphic overlays, speed changes, background changes, word or phrase insertions, more complex story changes, utilization of video libraries, digital video effects (DVE's) and transitions, and seamless synthetic voices, characters, and studio sets. Many of these scenes or segments may also be modified at message assembly time according to the selected environmental inputs, or interpretation of individual viewer inputs.

Advantages of the present invention include message creation upon order, not by forecast, with story-driven message assembly tailored to the individual and any combination of information known about the target viewer and the present environment. A new marketing paradigm is created, with the focus on differentiating customers, not just products. This in turn creates new opportunities for increasing customer interest, satisfaction, and retention of the campaign message.

Other advantages include the automated real-time creation of the message, which solves problems of timeliness and personal privacy. Computers, not humans compose the final form of the ad from the raw materials and previously generated templates.

Other advantages of the present invention include a system and method for

gathering user profile information from a variety of different sources and databases, and processing the user profile information by a profiler which uses rules of assembly for creating a format usable by the message creation system.

Other advantages of the present invention include a system for creating templates with multiple insertable media features to create a personalized message for an individual or group. The number or type of insertable media features is not limited. For example, every element of a television commercial may be selected (or dynamically created) to fill in a template, including background view (such as a city skyline, and seasonal choices as well), music (background and jingles), language and accent of narrative, the choice of what narrative to add, the product being shown (for example a car or truck), the appearance of the product (for example the color of a car or accessorizations), selectable video of real actors, the length the commercial runs, any screen over text, etc. The media segments may all be created with the initial template, or created afterwards, including new media segments based on current events, but which are used in a template which has been in use for some time.

Another advantage is an expert rule base which allows the selection of proper media features for an individual, based on collected information about the individual. The expert rule base is able to use incomplete data or knowledge to make appropriate decisions about selecting media segments for an individual. The expert rule base can also make inferences about an individual based on available data.

Yet another advantage of the present invention is a highly flexible delivery system and method. The media messages may be assembled at any time during the process, anywhere from the time the message template and media segments are created, or up to and including real-time delivery where the media message is created and shown to the individual. Further the media message may be created at many different places, both centralized and decentralized, from the studio, to local station or web site, on a satellite, at a syndication station, at a cable television central office, neighborhood network, or even by a satellite receiver or cable box inside a viewer's home. Still further, the choice of delivery mediums is extremely varied, from prerecorded video tapes, DVDs, CDs etc. which are sent to an individual, to live feed through a cable system, internet connections, satellite link, RF towers, line RF signals, cell phones etc.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other features and advantages of the present invention will be more fully understood from the following detailed description of illustrative embodiments, taken in conjunction with the accompanying drawings in which:

Fig. 1 is a block diagram of a system according to the present invention;

Fig. 2 is a flow chart showing an overview of timing of media creation according to the present invention;

Fig. 3 is an overview of assembly of components to produce a media message according to one embodiment of the present invention;

Fig. 4 is a more detailed diagram of assembly of components as overviewed in Fig. 3;

Fig. 5 is a block flow diagram of an illustrative embodiment of a system according to the present invention;

Fig. 6 provides details of an example message template according to the illustrative embodiment of Fig. 5;

Fig. 7 provides details of an example message resource library associated with the message template of Fig. 6;

Fig. 8 illustrates assembly of a message according to example rules applied to the components of Figs. 6 and 7;

Fig. 9 is a block diagram of an embodiment of the present invention for personalized message delivery over an internet system; and

Fig. 10 is a block diagram providing more details of the embodiment of Fig. 9.

DETAILED DESCRIPTION

A system 20 for personal message creation and delivery according to the present invention is shown in Fig. 1. A user profile database 22 includes information regarding an individual 24. This user profile database 22 can be in any form, including a proprietary database of information owned by one entity, or publicly available information at one or at multiple locations, including information from user interactions on web sites or shopping networks. For example, the database may be a subscriber database accessed by

the system 20 on a per-transaction system. The user profile database may contain any type of information regarding the individual 24, including demographics, address, monetary income, political affiliations, known preferences, buying patterns etc.

A template database 35 includes message templates which reflects the story, or message that the message creator or provider desires to convey to the audience. This message is described in terms of a "campaign", in that the message may be any type of message from a product advertisement, to a political message or informative message which may be tailored for each individual or group receiver. Details regarding the creation of a campaign will be described below.

One or more libraries or databases 26 include media segments which are used to assemble the personalized message. The databases 26 include a compendium of elements that may be broadly categorized as graphics 28, video and sound segments 30, and animation 32. These media segments may be part of a general library of available material, for example pictures of individual city skylines, attractions, or natural scenery for use in backgrounds. Alternatively, media segments may be generally or specifically created for a certain message campaign. For example, in an automobile advertisement, several media segments showing a certain automobile model in different colors may be provided, which are to be inserted into a media template from the template database 35 at an appropriate location. Which media segment is selected for insertion depends on user 24 information, together with the media template specifications, as will be discussed below.

Similarly, the database for video and sound 30 and animation 32 may include both "stock footage" which are available as needed by any message campaign; and specific message campaign material created and stored for a particular campaign. Animation includes any type of animation such as cartoon characters and logos etc.

In addition to the resource library, the system according to the present invention is able to synthesize additional elements 34 as needed during message creation, thereby providing increased flexibility. Such synthesized elements include sound such as synthesized speech, music, background sounds, and graphics such as text, background filler, visual objects (including color variations thereof), and visual effects (including dissolves, morphing of objects, etc.).

The personalized messages are assembled by an assembly system 36. The assembly system receives a message template from the template database 35, and uses media segments from the databases 26 to put together the message. The assembly system 36 receives input on the user 24 from the user profile database 22, and also receives input from expert rules 38, which interpret the user profile data, and direct the assembly system 36 to select which particular segments from the databases 26 to combine for the personalized media message. The expert rules 38 system is capable of interpreting user profile data from many different sources and in many different formats. The expert rules 38 system is also capable of making decisions based on incomplete user profile data, providing logical "fallback" selections as necessary. The expert rules 38 system will be described in detail below.

The assembled personalized message is encoded for a delivery medium 40, and then delivered to the individual viewer 24, typically by a display device 42, which can be any of various types of receiver including television, computer monitor, radio, phone etc. The delivery medium can be any of various types of media, including prerecorded video tapes, DVDs, CDs etc. which are sent to an individual, or live feed through a cable system, internet connections, satellite link, RF towers, line RF signals, cell phones and the like. As the present invention facilitates real-time creation, personalized messages to individuals may be delivered in many different ways, based on the user profile. For example, an individual 24 with a satellite connection would receive a distribution in a format different from another individual 24 receiving a media message for the same campaign, but delivered by the internet. More detail regarding the delivery medium 40 will be provided below.

A campaign message process according to the present invention are outlined in Fig. 2. Campaign message programs are divided in three basic stages: message creation time 50, assembly time 58, and delivery time 64. During the campaign creation time 50, the producers define and create the message templates 56 and also create or select media segments 54 the system will need for generation of the personalized messages or advertisements, step 52. The message template 56 is the framework which holds the story together. Results of the creation step are stored in the template database 35 and the message resource library 26 as a set of message templates 56 and media segments 54.

At message assembly time 58, the present invention uses information from the user profile 60, message template 56 and media segments 54 to create the personalized message for the specific user 24, step 62. The system uses expert rules 38 to assist in the process.

The next step is message delivery time 64, where the personalized message is presented to the user 24. This presentation may involve transmitting the message, or placing the message on some type of media. As previously described, message creation time 58 and message delivery time 64 may be contemporaneous, in that the message is created on the fly, or "just in time".

Fig. 3 illustrates an embodiment of the invention in which substitution editing is implemented. A producer or editor working at an editing station 70 creates a message template 56 comprised of descriptions of different types of multi-media materials such as video, graphics, music and narration. The editor also creates or selects the media segments and consolidates them in the selected storage or database 54. User profiles 60 about the user 24 are obtained and fed to a rules system 38 for substitution editing. The rules system then selects raw materials from the media segments database 54 according to the message template 56 and user profile 60 and combines them to form a completed personalized message 72 that is delivered to the viewer 24.

Fig. 4 provides a more detailed view of the assembly stage according to an embodiment of the present invention for rules based substitution editing. A message template 56 is obtained from the message template database 35. The message template 56 describes a framework to create and complete a personalized message 72 for the selected individual 24. The message template 56 runs for a certain length of time, as shown by arrow 76. The final running time of the personalized message may vary, as according to the present invention, the message can be diversified on many levels, including short messages or very long messages, as appropriate for the individual 24.

The message template 56 may include both predefined sequences 78 and insertable sequences 80. Predefined sequences 78 are media segments which are common to all final personalized messages 72, in that they do not vary based on the individual 24. In the example message template 56, the first sequence 78 is a predefined sequence. In this presented embodiment, the predefined sequences are stored in the

media segment database 26, and inserted at the appropriate locations in the message template 56. The predefined sequences 78 only differ in the same predefined sequence 78 is always selected for that location in the personalized message. Alternatively, the predefined sequences may be stored or linked directly into the appropriate location in the message template 56.

The other sequences are insertable sequences 80, which are filled in as directed by the rule system 38. The rule system 38 receives information from the template database 35 regarding the message template 56 being assembled, and also receives user profile information 22. The rule system then determines the appropriate media segments to insert into the insertable sequences 80 of the message template 56. For example, the first insertable sequence 80a is video selected from the video and sound database 30. A next insertable sequence 80b is also selected from the video and sound database 30. Continuing with the present example, a predefined sequence 78 is then followed by an insertable sequence 80c comprising animation from animation database 32. The next insertable sequence 80d is another video segment from the video and sound database 30, followed by a final insertable sequence from the animation database 32.

Also the predefined sequences 78 and insertable sequences 80 are shown in the present example with no overlap, however the present invention is not limited to orthogonal assembling of media segments. All elements of the personalized message can be controlled, and combined in various forms to provide powerful customization. For example, a background scene 86 such as a geographic landscape, is selected from the video and sound database 30 and used as a common background for the predefined segments 78 while insertable segments 80 are added to the message template 56. The background scene 86 is not used for the end of the personalized message, in that the insertable sequences 80d and 80e do not use a background (or already have a background). In similar techniques, various physical elements may be inserted into standard video, for example the video and sound database 30 can include footage of several different actors providing dialog for a message, and the rule system 38 selects footage of a certain actor based on information from the user profile 22. The selected actor footage is then added as foreground in an insertable sequence 80. In this way, every element of a personalized message can be customized.

Additional elements such as music 84 can be added to the personalized message as appropriate. In the present example, music 84 is supplied for the end of the personalized message. The rule system 38 selects among the choices of music provided for insertion into the message template 56, and music is added from the video and sound database 30.

Another element provided for the message template 56 is narration 82, which for the present example is synthesized voice 34 which is created dynamically as needed. Alternatively, prerecorded speech can be used, including multiple selections of prerecorded speech, which is selected according to criteria processed by the rule system 38. For example, prerecorded speech may be in different languages, or with regional accents, allowing the present invention to customize the message with different rich media features for the message creation.

Fig. 5 shows an illustrative embodiment in which additional features of the invention are described, with details of the process of creating a campaign. Prior to the creation of a message or advertisement, a client works with the system operators to determine a formalized campaign plan 100 to be executed. The campaign plan is used by the client to define the communications task the client wishes to accomplish and, in turn, it drives all of the processes necessary to achieve the program.

The first step is to create rich media video composition example or examples of the message that the client wishes to deliver to the audience. Typically it will be of the prescribed time duration and exhibit one complete message as an example of one specific version of the intended communication. This provides the starting point for later construction of a message template or templates 56, Fig. 2 and a resource library (media segments 54) from which the various personalized versions of this message are assembled.

The next step involves target entity qualification data factors 104 Fig. 5. The client delineates the general characteristics of the members of the audience to which the message is to be delivered. It may include, for instance, appropriate media connection, family status, financial category, age grouping, regional location, etc. This information is used in the database searches to acquire the list of individuals or entities to which the message will be distributed.

The next step involves search databases selection 106, and allows the client to define the limits of the search by identifying the databases 200 which are to be searched for data input. The entity profile database itself can be an input source built up interactively with the target entity.

The next step involves creating an entity profile template 108. The entity profile template 108 is a complete or partial definition of the information about each individual or entity that is to be acquired by the search as well as a pattern for the formatting of this data. It is used in the generation of the target entities profiles and status database which not only governs the resources and rules used to assemble each personalized message, but also is the repository for all of the interactive information received from the target user 24.

The next step, called distribution channels selection 110, is defined by the campaign. It allows the client to decide what media outlet or outlet priority he wishes to use to communicate with his target audience.

The next step is the definition of the delivery window specifications 112. These specifications define a time duration over which the campaign will be executed as well as if special time and/or programmatic related conditions are required. This information is the starting point for generating a master task schedule 118.

The next section involves interactive query response 114, whish is used to define any interactive transactions that may be utilized by the campaign such as acquiring additional information about the target entity, polling responses, purchase transactions, etc.

The next section involves environment status factors 116 and refers to establishing a description for existing environmental factors, for example weather, current interest rates, current travel fares, etc. that need to be updated at the time the message is transmitted to enhance the timeliness and relevance of the personalized communication packets.

The final section involves verification transaction financial factors 118, and is used to define all of the financial factors such as verification, billing, purchase transactions, etc. which must be monitored 201 and recorded 502. Also any actions to be taken as a result of this information are indicated in this section 118. At this point, the

client's work in configuring a campaign plan 100 is completed.

The next set of actions are directed towards preliminary service activities. The first step 204 in this process is to assemble the target entities profiles and status database 503. This is the working database for this illustrative embodiment. It relies on the database selector 200 which is driven by the campaign plan 100 to determine which databases 200 to search. This database 503 should be completed before any of the other activities may proceed since the information it contains is used by the other activities to complete their tasks. It may, however, be updated at a later time by the ongoing service activities including the query response tasks. The search is set up utilizing the target entity qualification factors 104 to decide which data records to retrieve and the entity profile template 108 to select and format the data for each individual or entity. It reserves fields for whatever polling, verification, transaction, or financial etc. information is required. This database 503 is the repository for all of the information generated by this embodiment about the target entities.

The next step 208 to be defined is the management of the query and response interface with the target entity. When present, this activity allows two way communication on a limited basis with the individual 24 who receives the message. It typically requires special capability embedded in the media distribution network. It also needs to be able to distinguish the identity of the sender and associate his responses with his data profile. Timing is coordinated by the Master Task Schedule 308.

The process of determining the message template 400 is an important part of this embodiment. The template embodies the rules for assembling personalized messages utilizing the profiles data and the resource library 26 Fig. 1. An operations diagram for this activity will be described in reference to Fig. 6. It typically relies on the range and detail of the formatted profile information, the campaign plan example message, and the requirements for any query/response activity that is specified.

Once the message template has been constructed, then a message resource library 26 is created, step 300 Fig. 5. This resource library 26 contains the alternate clips of video and audio needed to assemble the whole range of different messages. One sub-process 304 has the instructions to receive environmental information, and synthesize the video and/or audio segments required by the message template for timely individualized

message assembly. Another sub-process 302 provides the ability to synthesize, on the fly, artificial speech and visual constructs to meet the individual specifications indicated by the different entity profiles. Obtaining and maintaining current environmental information is a separate parallel operation 306 that is constantly polling the appropriate information channels and making the acquired data available on demand to the unit 304 that synthesizes this status information for the resource library. This information can be obtained from places such as the internet, the weather service, a news service, a private internet or intranet, etc.

A next step 308 is to establish the master task schedule. The information gathered by the campaign plan 100 is formatted such that it outlines the process flow and coordination requirements for each step of the ongoing service project from initiation to completion. This data is utilized to establish the master task schedule which controls and coordinates all of the activities and events as soon as its project "clock" is started.

The next set of actions are directed towards service execution and delivery. After the preliminary service activities have been executed (except for timely updates) the schedule "clock" may be started. This controls the scheduled generation and delivery of the projects personalized messages to all of the profile entities in the target entities profiles & status data base 503. Execution is a continuous step and repeat process which can deliver on the fly or accumulate appropriate batches for simultaneous delivery. Each step begins with the presentation of the next profile 206 to the assembly node 404 which uses this profile to select and assemble the correct material from the resource library into its "slot" in the appropriate selected message template. It then sends the assembled message on to the transcoding and/or compressing operation 406 which delivers a video stream that matches the specifications for the delivery media. These video messages are transported to the chosen media distribution center 212 for delivery at the scheduled time to the media user interface 214 which communicates with each appropriate target entity 214.

When creating the campaign plan, the campaign manager working with the client to encode a default message example 102. The example serves as a message template containing a rich media video composition of the message that the client wishes to deliver to his audience. The example is of the prescribed duration and exhibits one complete

advertising or other message as an example of one specific version of the intended communication to be delivered. This provides the starting point for later construction of a message template 400 and a resource library 300 from which the various personalized versions of the message are to be assembled.

The client delineates the general characteristics of the members of the audience to which he wishes his communication to be delivered. It may include for example appropriate media connection criteria, family status, financial category, age group, regional location, etc. The resulting set of target entity qualification data factors 104 is used in database searches to acquire the list of individuals or entities to which the message will be distributed. Further criteria for search database selection 106 are also defined by the client.

An entity profile template 108 is also created as a complete definition of the information about each individual or entity that is to be acquired by the search as well as a pattern for the formatting of the retrieved data. This entity profile template 108 is also used in the generation of the target entities profiles and status database 204 which not only governs the resources and rules used to assemble each personalized message but also is the repository for all of the interactive information received from the target entity. A distribution channel selection 110 defines itself. This selection allows the client to decide what media outlet or outlets he wishes to use to communicate with his target audience.

Client campaign plans also define the delivery window specifications 112. These specifications define a time duration over which the campaign will be executed as well as when special time or programmatic related conditions are required. This information is the starting point for generating a Master schedule 308.

Interactive query responses 114 are defined where the campaign desires to acquire additional information about the target entity, poling responses, purchase transactions, etc. The client can also define environmental status factors 116. These factors will need to be updated at the time the message is transmitted to enhance the timeliness and relevance of these personalized communications packets. Examples include the weather in various places, current interest rates, current travel fares from place to place, etc.

As a final preparation for operations, the client and system operators define all of the verification transaction financial factors 118 which must be monitored and recorded.

This element also includes definitions for any actions to be taken as a result of this information.

Once the campaign plan has been encoded, a set of preliminary service activities takes place in preparation of the elements necessary for the dynamic customization phase. The first activity is to assemble target entities profiles and status database 204. This is the working database for the whole current dynamic customization system. It relies on the database selector 200 which is driven by the search database selection 106 to determine which databases to search. This database 204 must be completed before any of the other activities may proceed, since the information it contains is used by the other activities to complete their tasks. It may, however, be updated at a later time by the ongoing service activities including the query response tasks. The search is set up utilizing the target entity qualification factors 104 to decide which data records to retrieve and the entity profile template 108 to select and format the data for each individual or entity. It reserves the fields for whatever polling, verification, transaction, or financial information is required. This database is the repository for all of the information generated by the system about the target entities.

The next activity in preliminary services is the management of the query and response interface 208 with the target user 24. When present as part of the campaign, this activity allows two-way communication on a limited basis with the individual who receives the message. Use of this feature may be implemented by the media distribution network, such as a set-top box interface, for example web TV. Preferably, the interface can distinguish the identity of the sender and associate his response with his data profile. The timing of any user interaction is coordinated by the master task schedule 308.

The process of determining the message template 400 is described below. The message template 400 embodies the rules for assembling personalized messages utilizing the profiles data and the resource library. The message template process relies on the range and detail of the formatted profile information, the campaign plan example message, and the requirement for any specified query/response activity.

Once a message template has been constructed 400, then a resource library must be created 300. This library contains the alternative clips of video and audio needed to assemble the whole range of different messages. One sub-process assembles the whole

range of different messages. Another sub-process receives environmental information 306 and synthesizes 304 the video and audio segments required by the message template for timely individualized message assembly. Another sub-process will provide the ability to synthesize 302, on the fly, artificial speech and visual constructs to meet the individual specifications indicated by the different entity profiles.

A separate process running in parallel obtains and maintains the environmental information 306 by constantly polling the appropriate information channels and making the acquired data available, on demand, to the synthesizer process 304 for the resource library 300. This information could be obtained from places such as the Internet, the weather service, a private intranet, local sensors, etc.

The information gathered in the campaign plan 100 must be formatted such that it outlines the process flow and coordination requirements for each step of the ongoing service project from initiation to completion. This data will be used to establish the master task schedule 308 which controls and coordinates all of the activities and events as soon as the project "clock" is started.

After the preliminary service activities have been executed (except for timely updates) the schedule "clock" is started. This controls the scheduled generation and delivery of the dynamically customized advertisements to all of the profile entities in the target entities profiles and status database 204. Execution is a continuous process of "step and repeat" which can deliver messages on demand or else accumulate appropriate batches for simultaneous delivery.

Each step begins with the presentation 206 of the next profile to the assembly node 404 which uses this profile to select and assemble the correct material from the resource library 300 into its "slot" in the message template 400. It then sends the assembled message on to the transcoding and compressing operation 406 which delivers a video stream that matches the specifications for the delivery media. These video messages are then transported to the chosen media distribution center 212 for delivery at the scheduled time to the media user interface 214 which communicates with each appropriate target user 24. The process is then repeated for the next profile 206 until all listed profiles are serviced.

Fig. 6 illustrates a sample message template 56. The message template(s) 56

design is determined using information from the default message example 102 Fig. 5 and the general criteria that defines the entity profile template 108 together with any interactive information relevant to the message. The range of values for each media segment derives initially from the information given in the campaign plan 100 about the default message example 102 and its variations. Beyond that, the entity profile template 108 establishes the breadth of information sought for each profile category such that it will provide adequate information to customize the desired segments for the chosen entity. In addition, some information can be derived from the interactive responses of the client entity as well as from the updated environment status information provided to the message resource library databases 26. The message template 56 Fig. 6 is the mold into which the proper selection of resources are "poured" to form the specific message for the specific entity whose profile has been presented for assembly.

The message template or templates 56, together with the breadth of information established as previously described, forms the basis for generating the message resource library 26. Each defined media segment 54 for each video and audio track of the message template 56 requires at least one or more alternate segments 54 to be generated to provide the full range of variations required to cover all of the profile categories and the variation in category types. Alternatively, the message resource library can be updated with new alternate segments 54 and the expert rules 38 updated to provide finer granularity in customization based on feedback from initial use of the campaign. The expert rules 38 according to the present invention allow for continuous tweaking of the message assembly. The message resource library also keeps updated information on any current environmental status information needed to assemble the messages.

These video and audio segments will generally be stored on high capacity, high speed servers 200 Fig. 5, at the highest quality level needed by any of the target media through which the messages will be distributed. They are available to the assembly operation in "real time" for production "on the fly". Each segment 54 is sized to fit its template slot and have its own identity and time code location for rapid retrieval by the assembly operation. In another embodiment, alternative segments for one template slot can vary in length, and the system automatically adjusts the final message to properly fit in the total time slot. Typically this is performed by shortening a following segment,

which may be created to allow such variations in length.

The next profile 60 of a user 24, Fig. 5 for whom the current message is being customized is pulled from the target entities profiles & status database 503 that contains all of the data collected to "fill" the profile template 60 Fig. 8 for each of the entities selected for the current campaign. This profile 60 need not be limited to passive accretion of facts but may include information derived by sophisticated behavior analyze of buying habits etc. Each profile 60 is presented to the assembly operation to be used as a basis for selecting the media segments 54 that are appropriate to this specific profile to be placed in each of the slots in the message template 56.

The assembly operation 404 proceeds in a rudimentary fashion by selecting each media segment 54 from its alternates by simply locating the segment in each category that includes the profile's value for that category and using the default segment when no information is available for that slot, as shown in Fig. 8. Alternatively, a more powerful form of selection is used based on a logical rules to evaluate several pieces of information for any selection including how to deal with gaps in the profile by evaluating and interpolating other available information. Some example computer code written in a variation of the Lisp programming language is presented in the Appendix.

The first stage of completion results in an edit decision list which is a set of instructions for the assembly of this specific message by a video editing function using the message resource library 26. This causes a high quality video stream of the message to be generated which is then sent together with its ID to the transcoding operation, which is described below.

Another embodiment of the present invention for delivering personalized messages is shown in Fig. 9. This embodiment is an example of personalized message creation as a service industry, where clients send requests electronically to a service provider, who creates the personalized message and sends the personalized message either back to the client, or directly to the user. The personalized message may be displayed to the user immediately, or alternatively, the personalized message may be stored by the requesting client to provide to the user at a later time, either by web page or by other delivery methods 155, such as hard media (video tapes, video disks, dvd etc). or by electronic means (email, cable TV, satellite etc.).

The client 130 sends a request, including a user identification to the server 134. The user identification 132 provides information identifying the user, to allow for searching and obtaining user profile information. A standard user identification such as a user email address, domain number or social security number may be used, or a specific user identification used or created by the client. The server sends a request to the system 20 which is providing the service. The server 134 also indicates a particular campaign to be used for creating the user-specific personalized message. A campaign scheduler 142 sets up and queues the creation of the personalized message by the system 20.

Upon commencement, the profile server 503 gathers profile information 60 on the user. The profile server 503 can obtain profile information from many sources, including databases 200, as previously described. The profile server 503 then sends the gathered information including the user profile information 60, message template 56 information and specific campaign rule information to the message generator 145. The message generator 145 uses expert rules 38 as well as other sources of environmental and temporal data 147 (such as weather, time, current events etc.) to select appropriate media segments for completion of the message template 56. The message generator then sends a media playout list 148 to the assembly system 36, which obtains the appropriate media segments from the databases 26 and produces the personalized message. Depending on the delivery requirements, the personalized message may be sent directly to the delivery target 155, or may be encoded by a media encoder 40 which performs any conversion or compression necessary to produce a deliverable personalized message.

Another embodiment of the present invention is shown in Fig. 10. This embodiment is similar to the embodiment in Fig. 9, except with more focus on message creation and delivery over the internet or world wide web. This is an example of "just in time" creation on demand, to display to a user who is actively viewing a web site on which the personalized message will be immediately displayed.

Turning to Fig. 10, A client browser 130 sends a user identification 132 to the web server 134. The user identification 132 is sent along with a campaign identification, which indicates what campaign to use to create the personalized message for the user.

The web server 134 passes the received information on to the transaction processor 138, typically over an electronic connection such as the internet, a dedicated

telephone connection etc. The transaction processor 138 oversees much of the operation of creating the personalized message, including sequencing of many of the steps in the operation, and bookkeeping for client records and billing. For creating the personalized message, the transaction processor 138 send the user identification 132 to the profile server 503, which gathers profile information 60 on the user, as previously described. This profile information 60 is returned to the transaction processor 138.

The transaction processor 138 sends the campaign identification to the campaign scheduler 142, which schedules and sets up tasks and actions to be performed in the personalized message creation. The campaign scheduler controls the performance of the message generator 145. The message generator 145 receives the profile information 60 and further information 144 (such as parameters associated with the campaign) from the transaction processor 138.

The message generator 145 provides the profile information 120 and message template 56 to the expert rules system 38, which is responsible for completing the message template 56 with selected media segments for each part of the template. The expert rules system 38 uses rules as previously described to determine the appropriate media segments. The completed template 146 is then returned to the message generator 145 which sends a media playout list 148 to the transaction processor 138.

The transaction processor 138 provides the media playout list 148 to the media server 149 which assembles all the media segments together to produce the video stream 150 of the personalized message. The video stream 150 is provided to the media encoder 40, to properly encode the video stream for delivery. In the present embodiment, this is an encoded video stream 154 which is sent to the client browser 130, for delivery to the user.

In this embodiment, the transaction processor 138, profile server 503, campaign scheduler 142, message generator 145 expert rules server 38, media server 149 and media encoder 40 run on separate general purpose computers running Windows NT or Linux. These computers are interconnected as appropriate for the location of each component and the bandwidth requirements for communication therebetween. Alternatively, several components may run on one machine as one application, or as separate processes.

In an alternative embodiment, the present invention may be implemented with a

plurality of message templates for one campaign, with a template selection mechanism for selecting an appropriate template based on profile information for the end user, or on other factors. For example, if it is presently raining in a location where the end user is, a message template created with bad weather in mind may be selected over a "good" weather message template, or a generic template. These plurality of message templates may have common insertable message segments, or use different libraries of insertable message segments, or even have few or no insertable message segments.

Although the invention has been shown and described with respect to illustrative embodiments thereof, various other changes, omissions and additions in the form and detail thereof may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

APPENDIX

```
;;;SAMPLE EXPERT RULE FOR PRESETTING A SET OF USER-DEFINED
AND ;;;ENVIRONMENT PARAMETERS
(define Mobil (user user_age user_language user_sex
middle_age user_card user_zip)
        (
                (age
                        (cond
                                ((< user_age 13) child)
                                ((< user_age 20) teen)
                                ((< user_age 35) young)
                                ((< user_age 60) middle)
                                ((< user_age 85) senior)
                                (t elderly)
                        )
                )
                (weather (getenv (weather user_zip)))
                (temperature (getenv (temperature
user_zip)))
                (language user_language)
                (sex user_sex)
                (category
                        (cond
                                ((and (equal user_language
German) (equal user_sex Male) (< user_age 35)) F)
                                ((equal user_card amex) E)
                                ((equal user_card mobil) D)
                                ((and (equal user_sex Male)
(< user_age 35)) A)
                                ((and (equal user_sex
Female) (> user_age 35)) C)
                                (t B)
                        )
                )
        )
```

```
)


;;;; SAMPLE EXPERT CODE WHICH DEFINES A PLAYLIST
(la VO1);load audio source
(aap 1 (BLACK . 36));aap is apend audio playlist
(aap 1 ((VO1 . "16:29:42;13" ) . 853))
(aap 1 (BLACK . 11))
(la TechnoA1)
(aap 0 ((TechnoA1 . "16:01:05;23" ) . 892))
(aap 0 (BLACK . 8))
(ls Kj)
(ls KeyFinal)
(ls Kaa)
(ls Ku)
;;ap is append playlist, parameters are a video segment,
pulled ;;by reference index, and a length value, measured in
frames
(ap ((Kj . "16:52:54;20" ) . 40))
(ap ((KeyFinal . "00:00:14;21" ) . 16))
(ap ((KeyFinal . "00:00:15;25" ) . 3))
(ap ((KeyFinal . "00:00:15;10" ) . 3))
(ap ((KeyFinal . "00:00:15;25" ) . 3))
(ap ((KeyFinal . "00:00:15;16" ) . 3))
(ap ((KeyFinal . "00:00:15;25" ) . 3))
(ap ((KeyFinal . "00:00:15;22" ) . 28))
(ap ((KeyFinal . "00:00:17;13" ) . 5))
(ap ((KeyFinal . "00:00:16;25" ) . 147))
(ap ((KeyFinal . "00:00:17;13" ) . 5))
(ap ((Kaa . "18:12:38;19" ) . 6))
(ap ((Kaa . "18:12:39;09" ) . 6))
(ap ((Kaa . "18:12:39;29" ) . 6))
(ap ((Kaa . "18:12:40;19" ) . 6))
(ap ((Kaa . "18:12:41;09" ) . 7))
(ap ((KeyFinal . "00:00:22;28" ) . 61))
(ap ((Ku . "17:41:24;29" ) . 4))
(ap ((Ku . "17:41:25;13" ) . 4))
```

```
(ap  ((Ku . "17:41:25;27" )  . 4))
(ap  ((Ku . "17:41:26;11" )  . 4))
(ap  ((Ku . "17:41:26;25" )  . 4))
(ap  ((Ku . "17:41:27;09" )  . 4))
(ap  ((Ku . "17:41:27;23" )  . 4))
(ap  ((Ku . "17:41:28;07" )  . 4))
(ap  ((KeyFinal . "00:00:26;01" )  . 37))
(ap  ((KeyFinal . "00:00:26;17" )  . 11))
(ap  ((KeyFinal . "00:00:27;22" )  . 108))
(ap  ((KeyFinal . "00:00:32;16" )  . 8))
(ap  ((KeyFinal . "00:00:32;16" )  . 20))
(ap  ((KeyFinal . "00:00:32;16" )  . 8))
(ap  ((KeyFinal . "00:00:32;16" )  . 325))
(ap  (BLACK . 3))
(at 0 (text "Visible World" 0.1 0.20 35 "Courier" 0.0 0.5
0.5) 60); at is apply text, for text graphics
(at 0 (text "527W, 34th street" 0.1 0.35 40 "Courier" 0.0
0.5 0.5) 60)
(at 0 (text "New York, NY 10001" 0.1 0.50 40 "Courier" 0.0
0.5 0.5) 60)
(at 0 (text "www.visibleworld.com" 0.1 0.65 40 "Courier" 0.0
0.5 0.5) 60)
(at 60 (text "Prepared for:" 0.1 0.20 40 "Courier" 0.0 0.5
0.5) 60)
(at 60 (text "Sonam" 0.1 0.35 40 "Courier" 0.0 0.5 0.5) 60)
(at 60 (text "English" 0.1 0.5 40 "Courier" 0.0 0.5 0.5) 60)
(at 60 (text "Date:01/19/00" 0.1 0.65 40 "Courier" 0.0 0.5
0.5) 60)
(at 60 (text "Time:15:52:10" 0.1 0.80 40 "Courier" 0.0 0.5
0.5) 60)
```

CLAIMS

1. A system for dynamically creating a personalized message for an intended audience, comprising:

a message campaign, defining a narrative framework for said personalized message, said message campaign including:

a message template, comprising a plurality of media segment slots;

a plurality of media segments, each media segment corresponding to one of said media segment slots of said message template, wherein several of said media segments correspond to a same one of said media segment slots of said message template;

a plurality of expert rules; and

a message assembly component, responsive to user profile data of said intended audience to apply said plurality of expert rules to said user profile data in order to select appropriate media segments for each of said media segment slots of said message template, in order to assemble said personalized message for said intended audience.

2. The system of claim 1 wherein said intended audience has no direct control over said narrative framework for said personalized message.

3. The system of claim 1 wherein said message assembly component also uses environmental or temporal information in order to select appropriate media segments for assembling said personalized message.

4. The system of claim 1 wherein said media segments are selected from the group including audio, video, background, animation, synthesized graphics and voice.

5. The system of claim 1 wherein several of said media segments which correspond to a same one of said media segment slots of said message template are of different lengths, and said message template appropriately adjusts said personalized message based

on a length of a selected one of said media segments.

6. The system of claim 1 wherein said personalized message is assembled immediately before presentation to said intended audience.

7. The system of claim 1 wherein said user profile data of said intended audience is obtained from a plurality of user information data sources.

8. The system of claim 7 wherein said message campaign includes a target entity profile, said target entity profile providing an indication of appropriate media segments for selected user profile data.

9. The system of claim 8 wherein said target entity profile provides an indication for selecting said intended audience from said user information data sources.

10. A method for dynamically creating a personalized message for an intended audience; said method comprising:

obtaining user profile data for said intended audience;

selecting a message template, said message including a plurality of media segment slots;

applying a plurality of expert rules to said user profile data and said message template, in order to select, from a plurality of media segments, appropriate media segments for insertion into said plurality of media segment slots in said message template;

assembling said personalized message using said message template and said selected media segments; and

providing said assembled personalized message in a format for delivery to said intended audience.

11. The method of claim 10 wherein said message template and plurality of message segments are created as part of a message campaign, which defines a narrative framework

for said personalized message.

12. The method of claim 10 wherein said steps of assembling said personalized message and providing said assembled personalized message is performed immediately before delivery to said intended audience.

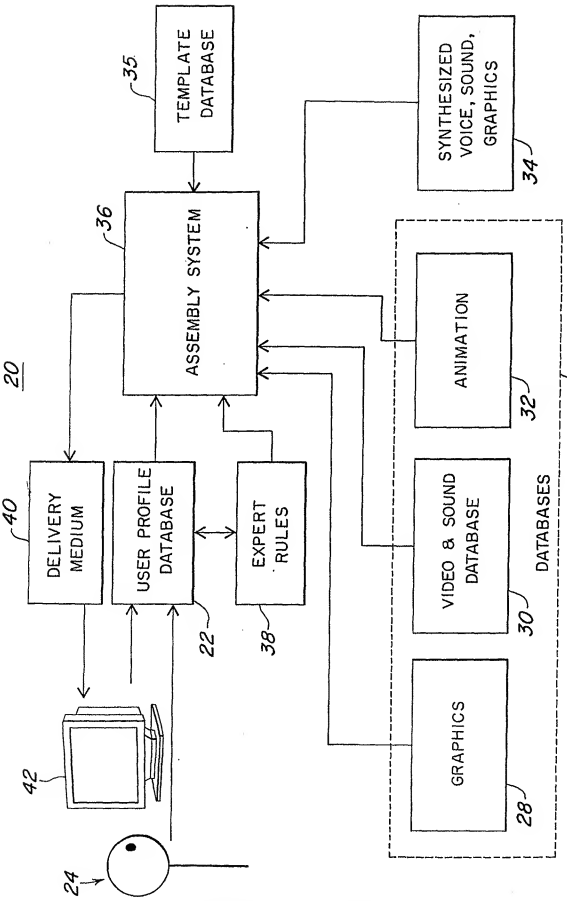
20
TEMPLATE DATABASE
35
SYNTHESIZED VOICE, SOUND, GRAPHICS
34
36
ASSEMBLY SYSTEM
ANIMATION
32
26
40
DELIVERY MEDIUM
USER PROFILE DATABASE
22
EXPERT RULES
38
VIDEO & SOUND DATABASE
30
DATABASES
42
GRAPHICS
28
24

FIG. 1

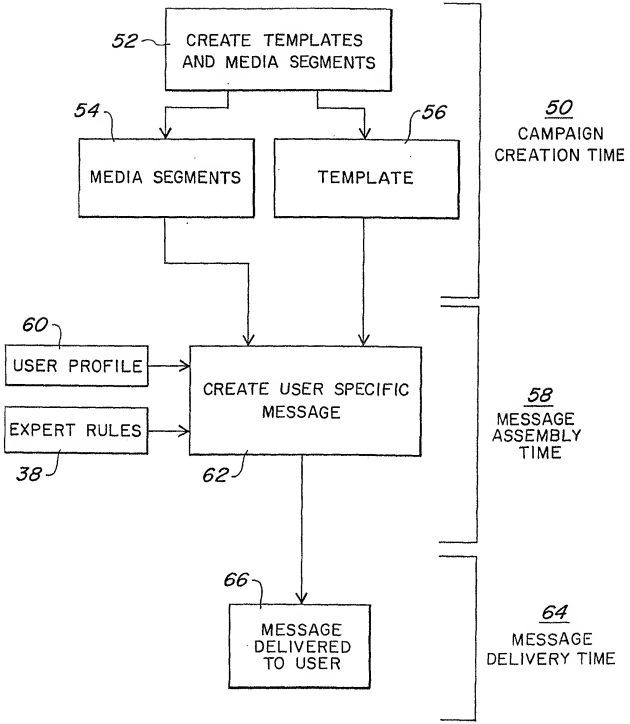
52
CREATE TEMPLATES AND MEDIA SEGMENTS
54
56
MEDIA SEGMENTS
TEMPLATE
50
CAMPAIGN CREATION TIME
60
USER PROFILE
EXPERT RULES
38
CREATE USER SPECIFIC MESSAGE
62
58
MESSAGE ASSEMBLY TIME
66
MESSAGE DELIVERED TO USER
64
MESSAGE DELIVERY TIME

FIG. 2

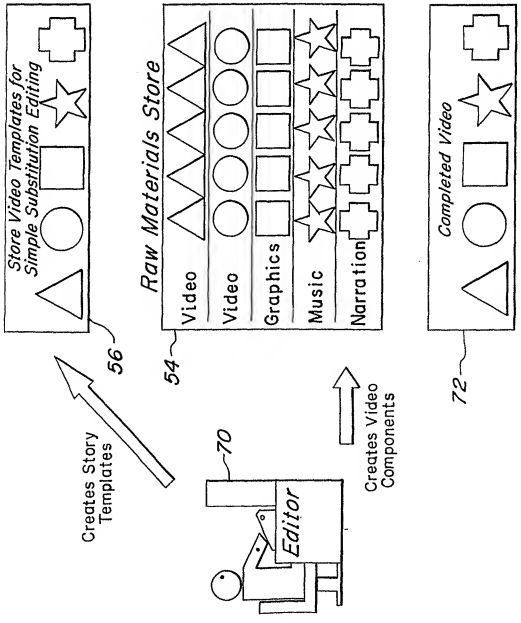
Creates Story Templates
Editor
70
Creates Video Components
Store Video Templates for Simple Substitution Editing
56
Raw Materials Store
Video
Video
Graphics
Music
Narration
54
Completed Video
72
Use Story Template
Rules System for Substitution Editing
38
Select Rich Media
Make Final Assembly
Get User Profile
60
Viewer
24
Deliver Personalized Ad

FIG. 3

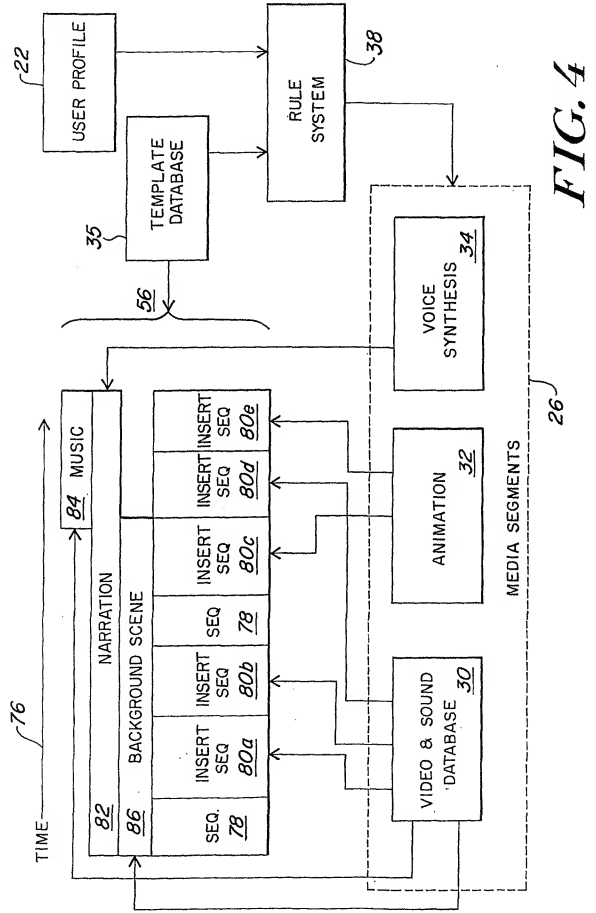
22
USER PROFILE
38
RULE SYSTEM
35
TEMPLATE DATABASE
56
VOICE SYNTHESIS 34
26
MEDIA SEGMENTS
ANIMATION 32
VIDEO & SOUND DATABASE 30
76
TIME
84 MUSIC
82 NARRATION
86 BACKGROUND SCENE
SEQ. 78
INSERT SEQ 80a
INSERT SEQ 80b
SEQ 78
INSERT SEQ 80c
INSERT SEQ 80d
INSERT SEQ 80e

FIG. 4

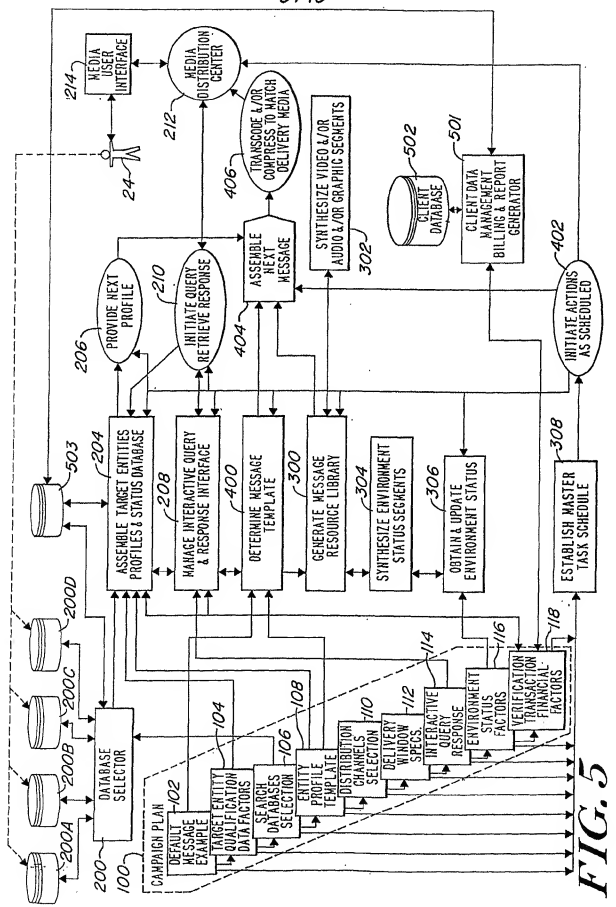
100
CAMPAIGN PLAN
200
DATABASE SELECTOR
200A
200B
200C
200D
202
DEFAULT MESSAGE EXAMPLE
104
TARGET ENTITY QUALIFICATION DATA FACTORS
106
SEARCH DATABASES SELECTION
108
ENTITY PROFILE TEMPLATE
110
DISTRIBUTION CHANNELS SELECTION
112
DELIVERY WINDOW SPECS
114
INTERACTIVE QUERY RESPONSE
116
ENVIRONMENT STATUS FACTORS
118
VERIFICATION TRANSACTION FINANCIAL FACTORS
503
204
ASSEMBLE TARGET ENTITIES PROFILES & STATUS DATABASE
208
MANAGE INTERACTIVE QUERY & RESPONSE INTERFACE
400
DETERMINE MESSAGE TEMPLATE
300
GENERATE MESSAGE RESOURCE LIBRARY
304
SYNTHESIZE ENVIRONMENT STATUS SEGMENTS
306
OBTAIN & UPDATE ENVIRONMENT STATUS
308
ESTABLISH MASTER TASK SCHEDULE
206
PROVIDE NEXT PROFILE
210
INITIATE QUERY RETRIEVE RESPONSE
404
ASSEMBLE NEXT MESSAGE
302
SYNTHESIZE VIDEO &/OR AUDIO &/OR GRAPHIC SEGMENTS
406
TRANSCODE &/OR COMPRESS TO MATCH DELIVERY MEDIA
212
MEDIA DISTRIBUTION CENTER
214
MEDIA USER INTERFACE
24
502
CLIENT DATABASE
501
CLIENT DATA MANAGEMENT BILLING & REPORT GENERATOR
402
INITIATE ACTIONS AS SCHEDULED

FIG. 5

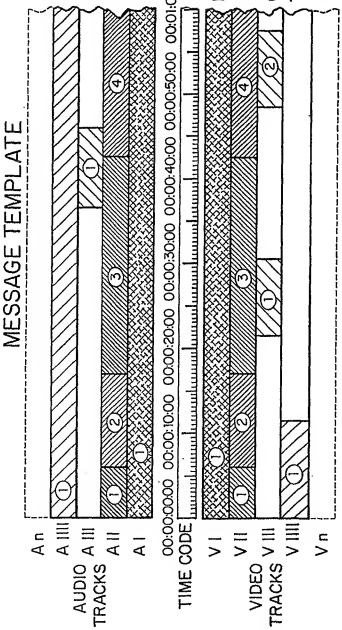
56
MESSAGE TEMPLATE
AUDIO TRACKS
A n
A III
A II
A I
TIME CODE
00:00:00:00 00:00:10:00 00:00:20:00 00:00:30:00 00:00:40:00 00:00:50:00 00:01:00:00
VIDEO TRACKS
V I
V II
V III
V n
ETC.
MUSIC
EFFECTS
AUDIO WITH
VOICE OVER
BACKGROUND
FOREGROUND
OVERLAY GRAPHICS
TITLEING
ETC.

FIG. 6

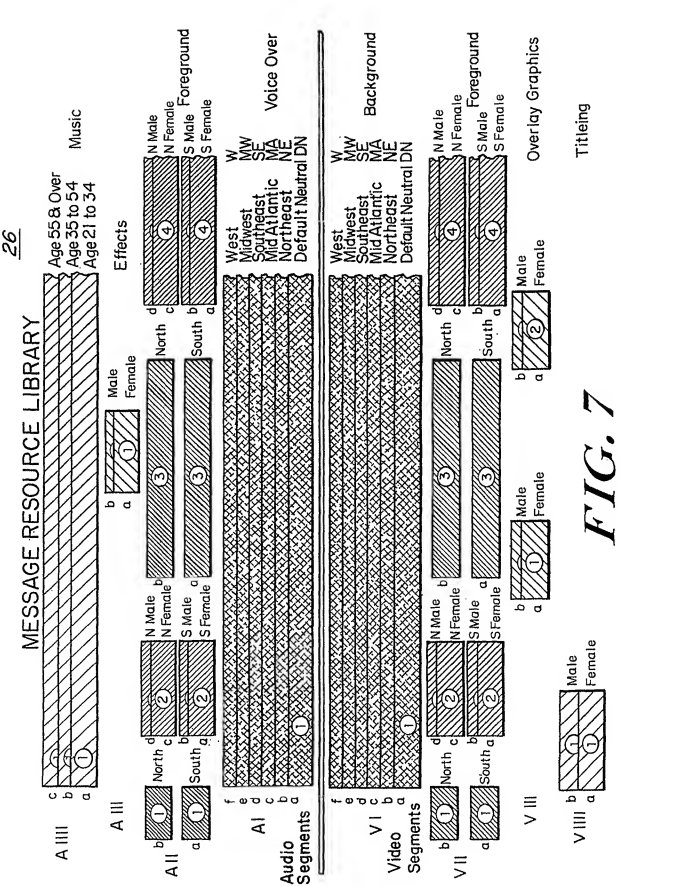
26
MESSAGE RESOURCE LIBRARY
Audio Segments
Video Segments
A IIII
A III
A II
A I
V III
V II
V I
V IIII
Age 55 & Over
Age 35 to 54
Age 21 to 34
Music
Effects
Male
Female
North
South
N Male
N Female
S Male
S Female
Foreground
West
Midwest
Southeast
Mid Atlantic
Northeast
Default Neutral DN
W
MW
SE
MA
NE
DN
Voice Over
Background
Overlay Graphics
Titleing

FIG. 7

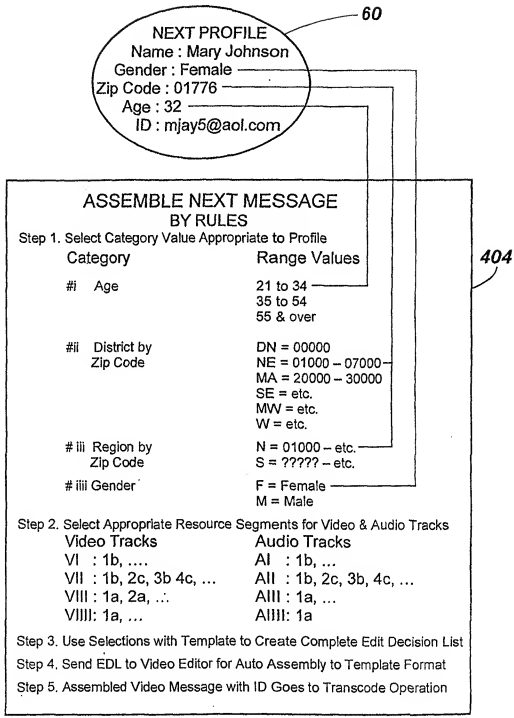
60
NEXT PROFILE
Name : Mary Johnson
Gender : Female
Zip Code : 01776
Age : 32
ID : mjay5@aol.com
ASSEMBLE NEXT MESSAGE
BY RULES
Step 1. Select Category Value Appropriate to Profile
Category
Range Values
404
#i Age
21 to 34
35 to 54
55 & over
#ii District by Zip Code
DN = 00000
NE = 01000 – 07000
MA = 20000 – 30000
SE = etc.
MW = etc.
W = etc.
# iii Region by Zip Code
N = 01000 – etc.
S = ????? – etc.
# iiii Gender
F = Female
M = Male
Step 2. Select Appropriate Resource Segments for Video & Audio Tracks
Video Tracks
VI : 1b, ...
VII : 1b, 2c, 3b 4c, ...
VIII : 1a, 2a, ...
VIIII: 1a, ...
Audio Tracks
AI : 1b, ...
AII : 1b, 2c, 3b, 4c, ...
AIII : 1a, ...
AIIII: 1a
Step 3. Use Selections with Template to Create Complete Edit Decision List
Step 4. Send EDL to Video Editor for Auto Assembly to Template Format
Step 5. Assembled Video Message with ID Goes to Transcode Operation

FIG. 8

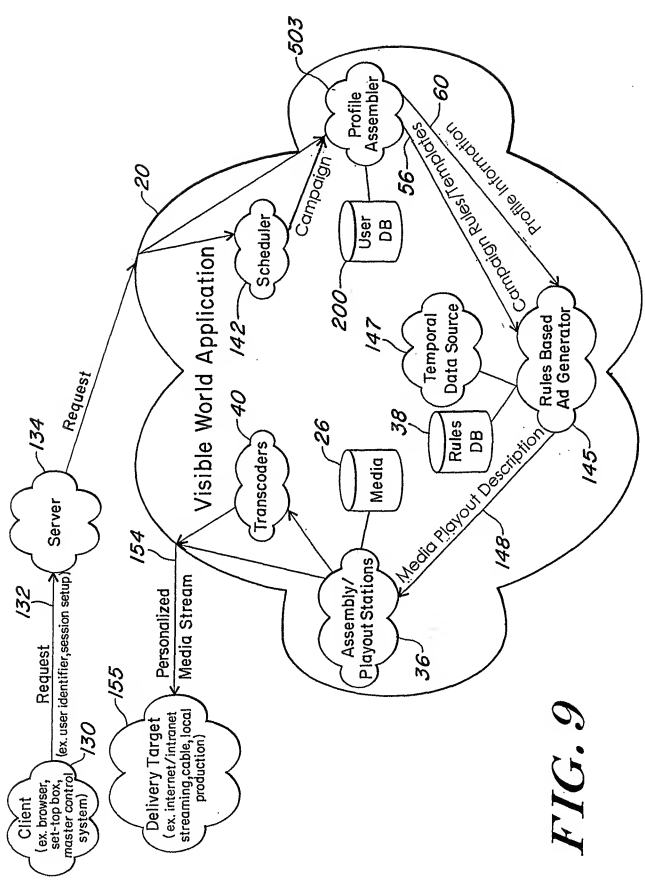
Client
(ex. browser, set-top box, master control system)
130
Request
(ex. user identifier, session setup)
132
Server
134
Request
20
Delivery Target
(ex. internet/intranet streaming, cable, local production)
155
Personalized Media Stream
154
Visible World Application
Transcoders
40
Media
26
Assembly/ Playout Stations
36
Scheduler
142
Campaign
503
Profile Assembler
60
User DB
56
200
Profile Information
Campaign Rules/Templates
Temporal Data Source
147
Rules DB
38
Rules Based Ad Generator
145
Media Playout Description
148

FIG. 9

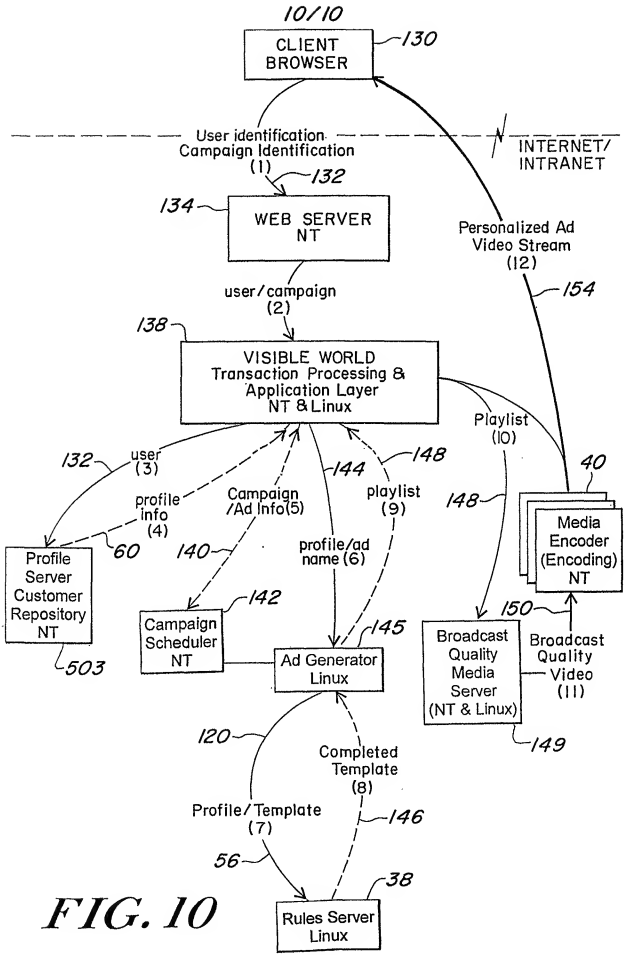
10/10
CLIENT BROWSER
130
User identification
Campaign Identification
(1)
INTERNET/ INTRANET
132
134
WEB SERVER NT
Personalized Ad Video Stream
(12)
154
user/campaign
(2)
138
VISIBLE WORLD
Transaction Processing & Application Layer
NT & Linux
Playlist
(10)
132
user
(3)
144
148
40
profile info
(4)
Campaign /Ad Info(5)
playlist
(9)
148
Media Encoder (Encoding) NT
60
140
profile/ad name (6)
Profile Server Customer Repository NT
142
150
Campaign Scheduler NT
145
Broadcast Quality Media Server (NT & Linux)
Broadcast Quality Video
(11)
503
Ad Generator Linux
149
120
Completed Template
(8)
Profile/Template
(7)
146
56
38
Rules Server Linux

FIG. 10